PLANNING BOARD ● 732 Main Street, Harwich, MA 02645

ph: 508-430-7511 ● fax: 508-430-4703

Planning Board Agenda
Town Hall, Griffin Room
Thursday, September 24, 2015 - 6:30 PM

I. Public Hearing

a. **Con't. PB2015-12 Mark T. Smith, applicant, c/o Donald F. Bracken, P.E., representative, Estate of Benjamin Chase, owner,** seeks approval of 10-lot (eight (8) buildable lots) Definitive Subdivision Plan for property located at 1369 Orleans Road in the R-R, W-R Zoning Districts and the Pleasant Bay Watershed, Assessor's Map 74, Parcels W4.

b. **PB2015-25 Agway of Cape Cod, applicant, c/o Stephanie J. Sequin, P.E., Ryder & Wilcox, Inc., representative, Leigh W. McKenney, TR., owner,** seeks approval of a Site Plan Review Special Permit and a Use Special Permit for Outdoor Display of Retail Sales to construct a new commercial 9,932 SF retail structure with outdoor displays and certain site amenities. The property is located at 1405 Orleans Road, Map 86, Parcel M2-1, in the C-H-2 & W-R Zoning Districts.

c. **PB2015-27 Grand Slam Entertainment, Inc. D/B/A Cape Batting Cages**, owner and applicant, Philip J. Fennell, President. The applicant seeks approval of a Site Plan special Permit for certain site improvements and the installation and operation of an aerial adventure attraction (zip-line) at 322 Route 28 (Zone C-H-1).

II. Public Meeting

a. **Informal discussion – Land Division Plan** for Gerald Coughlin and Freeman Allison, Map 81.

III. Old Business

IV. Briefings and Reports

V. New Business*

a. Minutes: September 10, 2015
b. Board of Appeals Advisory Opinions - September 30, 2015
c. CPC Representative

VI. Adjourn

**Per the Attorney General's Office: Boards/Commissions may hold an open session for topics not reasonably anticipated by the Chair 48 hours in advance of the meeting following "New Business".*

Subject to Change / Next Planning Board Meeting – Thursday, October 15, 2015

Requests for accommodations for any person having a disability can be made by contacting the Administration at 508.430.7517.
Recording & Taping Notification: As required by law, the Town may audio or video record this meeting. Any person intending to either audio or video record this open session is required to inform the chair.

Authorized Posting Officer: Elaine Banta, ebanta@town.harwich.ma.us / 508.430.7511

PB2015-12 Chase, Benjamin, Estate of (Smith, Mark)
Definitive Subdivision Modification Staff Report

Agenda Item # I.b.
September 24, 2015

To: Planning Board
From: David H. Spitz, Town Planner
Date: April 23, 2015
REVISED: September 16, 2015

Description
PB2015-12 Mark T. Smith, applicant, c/o Donald F. Bracken, P.E., representative, Estate of Benjamin Chase, owner. The petitioner(s) seeks approval of Definitive Subdivision Plan (without a preliminary plan) to subdivide the existing parcel totaling approximately 9.3± acres into ten (10) parcels with eight (8) buildable lots. The property is described in the application as 1369 Orleans Road in the R-R, W-R Zoning Districts and the Pleasant Bay Watershed, Assessor's Map 74, Parcels W4. The proposal is pursuant to MGL c.41 §81.K-GG as set forth in the Code of the Town of Harwich and the Rules and Regulations c. 400.

The applicant has named the subdivision 'The Preserve' and has submitted the following names for approval: 1) Arthur's Way, 2) Pressey Way, and 3) Liam's Way.

The proposed subdivision is shown on the following documents submitted to the Town Clerk:

1. A set of plans entitled "The Preserve", a Definitive Subdivision in Harwich, Massachusetts, dated February 9, 2015, ***revised September 4, 2015***, prepared by Bracken Engineering Inc. and by Hawk Design, Inc. including the following pages and descriptions:
   - Page 1 of 7 Cover Sheet
   - Page 2 of 7 Lotting Plan, prepared by Alan M. Grady, PLS
   - Page 3 of 7 Grading and Erosion Control, prepared by Donald F. Bracken, Jr., PE
   - Page 4 of 7 Grading and Erosion Control, prepared by Donald F. Bracken, Jr., PE
   - Page 5 of 7 Plan, Profile and Utilities, prepared by Donald F. Bracken, Jr., PE
   - Page 6 of 7 Plan, Profile and Utilities, prepared by Donald F. Bracken, Jr., PE
   - Page 7 of 7 Construction Details, prepared by Donald F. Bracken, Jr., PE
   - Page L1 Site Planting & Lighting Plan, prepared by Hawk Design, Inc.
   - Page L2 Site Planting & Lighting Plan, prepared by Hawk Design, Inc.
   - Page L3 Planting Details, prepared by Hawk Design, Inc.
   - Page L4 Planting Notes, prepared by Hawk Design, Inc.

2. A "Stormwater Report" for "The Preserve", prepared by Bracken Engineering Inc., dated February 9, 2015

Additional submitted document and revised plan as noted above:

3. Draft Declaration of Trust - The Preserve Homeowners' Association Trust

Waivers
No waivers have been requested.

Planning Staff Comments

Revised comments:
The Health department reaffirmed its approval of the definite conceptual subdivision plan per the memo date 04.23.2015 by Paula J. Champagne.

The revised plan, in conjunction with the draft trust document for the homeowners' association, indicates a common septic disposal system (with revised drainage and detail) and a 'no-cut' buffer zone along abutting residential properties lines of Lots #1 - #8. The private road has been labeled as Lot #10. All lots are addressed in the draft declaration of trust.

The proposal, without the benefit of a preliminary application, shows a 9-lot subdivision, including 8 building lots and 1 open space parcel, to be served by a private road laid out in accordance with the Planning Board Rules and Regulations.

This subdivision is located in the Pleasant Bay watershed and must meet advanced treatment requirements for that area as required under the Board of Health Rules and Regulations. The Board of Health has conceptually approved the application and, through the Health Director, has submitted a memorandum to that effect in satisfaction of MGL Chapter 41, Section 81U.

Specific details regarding location and maintenance of the wastewater treatment system have not yet been presented. The applicant should submit a written explanation of ownership and maintenance responsibilities for the open space parcel and the shared wastewater treatment system. If that explanation is sufficient, a condition of approval may require subsequent submission of easements and other details for the record.

The applicant's proposed road name, "Arthur's Way", meets administrative and E911 regulations.

If the applicant is proposing a development sign, the location should be depicted on the plan.

Administrative requirements have generally been met.

Comments from Other Boards/Committees/Departments
See above staff comment.

The following comments have been received:
Health: The subdivision is required to comply with Board of Health Regulation 1.211 for wastewater treatment – nitrogen removal in a centralized system. No variances shall be granted from Title 5 or Board of Health regulations. *(Memo dated 04.23.2015)*
Engineering: The road and drainage design appear to comply with Town subdivision standards, and represent good engineering practice.
Police: The entrance/exit must allow as much line of site as possible due to the speed and size of vehicles that operate on Route 39 in this area.

Water: An 8" D.I. water main must be brought from Route 39 to the farthest point of the property. Two fire hydrants must be installed – between lots 3 and 4 and at the end of the cul-de-sac.
Public Works, Building, Conservation, Fire: No concerns

MGL Reference

Pursuant to MGL c.41, §81U the Planning Board must, within 135 days of submission of application of a definitive plan without the benefit of review of a preliminary plan, render an approval or disapproval. ***The 135 days expired on June 25, 2015; however, the parties mutually agreed to several hearing continuations.***

Planning Board Votes / Options:

Findings of Fact: (Vote to adopt)

1. Said land is wholly within the Pleasant Bay watershed and is surrounded by residential developments.

2. Said subdivision for single-family homes is a permitted use in the underlying district, does not adversely affect the neighborhood and is compatible with the surrounding neighborhood.

3. Said lots demonstrate compliance of minimum dimensional requirements for area at 40,000 square feet and the minimum standards for frontage at 150' for Lots 1 - 6 and 8 and at 35' for the panhandle Lot 7.

4. The access for the panhandle Lot 7 is satisfactory for a driveway.

5. The Board of Health has conceptually approved a centralized nitrogen removal wastewater treatment system.

6. Adequate and appropriate faculties are provided and there will be no negative impact on properties or the environment.

7. Available sight distance on Route 39 is adequate for speed of travel.

8. ***Care and custody of Lot #9 (an open space parcel) and Lot #10 (a private road) are part of the draft declaration of trust instrument currently known as "The Preserve Homeowners' Association". Such instrument shall be recorded at the Registry of Deeds for Barnstable County.***

Vote: Definitive Subdivision

*Motion to **approve** the definitive subdivision plan for the applicant Mark T. Smith as shown on the plan set entitled "The Preserve", a Definitive Subdivision in Harwich, Massachusetts, dated February 9, 2015 and revised September 4, 2015, prepared by Bracken Engineering Inc. and by Hawk Design, Inc., Pages 1 – 7 & L1 – L4 along with the following conditions:*

1. The road shall be known as Arthur's Way.

2. Board of Health conditions shall be inscribe on the plan as specified in MGL c41, 81U.

3. A revised Mylar is required.

4. ***A standard Planning Board Agreement and Covenant shall be fully executed at the Barnstable County Registry of Deeds.***

5. ***The approved version of the draft Declaration of Trust shall be fully executed at the Barnstable County Registry of Deeds prior to the release of Agreement and Covenant noted in condition #4 above.***

*In the alternative the Board may **approve the plan with the modifications**: (Note: need to state the modifications/conditions), may **disapprove** the plan based on the following findings: (Note: need to state reasons for disapproval) or **continue the review** of the application and plan to a date and time certain (must state the date and time.)*

PB2014-25 McKenney TR, (Agway of Cape Cod) c/o S. Sequin, P.E.
Site Plan Review & Use Special Permits Staff Report

Agenda Item # I.b.
September 24, 2015

To: Planning Board
From: David Spitz
Date: September 17, 2015

Description

PB2015-25 Agway of Cape Cod, applicant, c/o Stephanie J. Sequin, P.E., Ryder & Wilcox, Inc., representative, Leigh W. McKenney, TR., owner, seeks approval of a Site Plan Review Special Permit and a Use Special Permit to construct a new commercial 9,970 SF retail structure with outdoor retail display and certain site amenities.

The property is located at 1405 Orleans Road in East Harwich, Map 86, Parcel M2-1, in the C-H-2 & W-R Zoning Districts. The site area is 3.3 acres and property frontage is 254 feet. As set forth in MGL c. 40A §9 the proposal is pursuant to the Code of the Town Harwich §325-9, §325-13.D, §325-55 and §400 for special permits as follows:

a. **Use Special Permit** for Outdoor display of nursery products and related nursery items
b. **Site Plan Special Permit**

Planning Staff also recommends that the applicant request an additional **Use Special Permit** for 20 or more parking spaces, as further described in the comments below.

Documents

The application, project narrative and the following plans/documents prepared for **Agway of Cape Cod** were submitted to the Town Clerk with several revisions:

1. "Site Plan – Existing Conditions", dated June 26, 2015, stamped by Philip O. Scholomiti, P.L.S., Ryder and Wilcox, Inc.

2. "Site Plan – Proposed Building", dated July 14, 2015, revised July 31, 2015, and revised September 2, 2015, stamped by Stephanie J. Sequin, P.E., Ryder and Wilcox, Inc.

3. "Proposed Building for Agway Garden Center, dated August 31, 2015, prepared by ConServ Group, Inc. unstamped, 2 sheets: Floor Plan A-1 and Elevations A-2.

4. 'Traffic Impact and Access Study', prepared by VHB, Inc., dated August 4, 2015

5. "Routing Diagram for Agway Existing Conditions" printed 09.04.2015

6. "Routing Diagram for Agway Proposed Conditions" printed 09.04.2015

7. "Drainage Areas – Existing Conditions" dated September 1, 2015, stamped by Judy Zandonella Bersin, P.E., Ryder and Wilcox, Inc.

8. "Proposed Grading & Drainage Areas", dated September 1, 2015, stamped by Judy Zandonella Bersin, P.E., Ryder and Wilcox, Inc.

9. "Proposed Utilities and On-Site Sewage Treatment and Disposal System", dated September 2, 2015, stamped by Stephanie J. Sequin, P.E., Ryder and Wilcox, Inc.

10. 'Proposed Landscaping Plan', dated September 2, 2015, prepared by Ryder & Wilcox, no stamp.

Additional documents and plans have also been submitted:

11. "Site Plan – Proposed Building", dated July 14, 2015, revised July 31, 2015, revised September 2, 2015, and revised September 16, 2015, stamped by Stephanie J. Sequin, P.E., Ryder and Wilcox, Inc.
12. Parking narrative and calculations, dated September 17, 2015.

Waivers

The following waivers have been requested:

1. **Section 325-39.A – Off Street parking schedule:** 32 where 46 are required. After Staff expressed concern about the size of the waiver request, the applicant modified the request to 39 spaces with 10 reserve spaces shown on the plan where 47 are required.

2. **Section 400-16.B.(3) – Landscape Plans:** General locations of trees due to the Site being heavily wooded with mature oaks and pines and existing trees in the perimeter buffers being retained.

3. **Section 400.17.B. – Drinking Water Protection District:** Hydrogeological Impact Statement due to review and action by the Board of Health on a request for a Certificate of Conformance under the governing Groundwater Protection Regulations.

Planning Staff also recommends that the applicant request an additional waiver for location of the loading area, as further described in the comments below.

Planning Staff Comments

The site area is 3.3 acres and property frontage is 254 feet. The parcel is located in the Drinking Water Protection District (Zone II) which requires extensive Board of Health review for the handling and storage of regulated materials under the governing Groundwater Protection Regulations. Additionally, the applicant must meet requirements for wastewater disposal and stormwater treatment.

Project access will be at two locations on Route 39 with the westerly driveway for entering and exiting vehicles and the easterly driveway for exiting vehicles only. The applicant's traffic

report (pages 12 and 13) indicates that sight distance at both locations far exceeds minimum requirements. The traffic report states that the exiting location will "be used primarily by delivery trucks leaving the loading area on the eastern side of the proposed building". However, subsequent comments by the applicant suggest that customers of both the propane filling station and bag storage area are also likely to use that exit. The applicant should provide a clear description at the Planning Board hearing of the entire site circulation pattern for customers, employees and delivery vehicles. Additionally, the traffic consultant should indicate whether circulation changes affect any of the findings of the traffic report.

The proposed loading area is along the east side of the building at a distance of more than 300 feet from Route 39. The applicant should request a waiver, as provided in §325-40, from the requirement to place the loading area at the rear of the building. Additional plantings should be placed near the easterly property line to screen the loading area from future development in the C-H-2 District.

A sidewalk exists along the entire Route 39 frontage of this parcel. While relatively little pedestrian traffic is expected at this site, the Planning Board should determine if a sidewalk should be provided along one side of the main entrance/exit from Route 39 to the building for a distance of approximately 200 feet.

The applicant has submitted a professionally-prepared traffic study following the Cape Cod Commission Guidelines for Transportation Impact Assessment Technical Bulletin 96-003. The consultant has responded to a number of preliminary questions and comments from Planning Staff relating to study area, trip generation, trip distribution, seasonal trips, rate of growth, and signalized intersection capacity. Planning Staff has recommended a condition of approval regarding retiming of the signal at the intersection of Routes 39 and 137 after completion of the project. The applicant has verbally agreed to this condition.

The applicant initially calculated parking requirements at 47 spaces with the entire 9,970 square foot building including warehouse space based on the Section 325-39 parking calculation for retail sales. An alternate calculation, based on a combination of retail and warehouse space, would yield a requirement for 36 spaces. With this large difference, Planning Staff asked the applicant to submit building size and available parking spaces for its other 3 stores in Orleans, Chatham and Dennis. The applicant's revised parking summary including a comparison to its other stores is attached.

The applicant's revised plan adds 7 gravel parking spaces (5 employee and 2 customer) for a total of 39 spaces. Additionally, the plan depicts 10 reserve spaces as allowed in Section 325-44. With a condition of approval based on this section, Staff recommends that a parking waiver is no longer needed. However a Use Special Permit for 20 or more new parking spaces is required. The applicant may make the request at the time of hearing.

Handicapped parking spaces must be striped and sized in accordance with Appendix 3, Figure 10 of the Planning Board Rules and Regulations.

The proposed landscaping plan includes a 40 foot wide landscaped strip along the entire Route 39 frontage; however, the applicant should explain if any plantings are envisioned within the area marked as "loam and seed with native grass mix". Additional planting is recommended along the easterly property boundary in the vicinity of the loading area, as noted above.

The location of a proposed propane filling station has been shown on the plan. The applicant has reviewed details with the Fire Department and has received its approval.

The location of a ground sign has been depicted on the plan. Specific sign details will require further review by the Building Department.

Administrative requirements have generally been met.

Comments from other Boards, Departments, Committees
Health: Board of Health approved a request for a 'Certificate of Conformance' to allow retail building and associated activities in a Zone II.
Building: 40% total site coverage and artificial recharge must be adhered to.
Engineering: See attached memos on drainage comments.
Police: Please keep in mind line of sight issues when planning landscape design including vegetation and plants.
Water: Relocate the vent on the absorption chamber so it does not cross over the water line.
Public Works: Several drainage concerns were noted before the applicant submitted revised drainage plans.
Fire: I fully endorse this plan. No issues at this time.
Conservation: No comment.

MGL Reference
Pursuant to MGL c.40 A, §9 the Planning Board must, within 65 days of submission of application for a special permit, hold a public hearing. The 65 days expire on September 17, 2015.

Planning Board Jurisdiction
Pursuant to the Code of the Town of Harwich §325-55.C expansion or reconfiguration of any parking lot and / or driveways and the establishment of any exterior space requires Site Plan Special Permit approval subject to §325-55.E.(1).
Pursuant to §325-55.E.(1) If the site plan meets the requirements of this By-law and the Planning Board Rules and Regulations Governing Subdivision of Land and Site Plan Review, as amended, the Planning Board shall approve it… However, the Board cannot deny approval of a site plan for a use which is allowed by right (not by special permit) in the district, but may impose reasonable conditions on the proposed use (§325-55.E.(2)).

Proposed Findings: (Vote to adopt)
1. The proposed retail use is a permitted use in the commercial C-H-2 Zoning District and outside storage for retail sales use is allowed by Special Permit in that district.

2. The proposed business operation of a nursery / lawn and garden supplies operation naturally requires outdoor product displays and sales.

3. The retail sale of products and outdoor storage of retail sales are appropriate uses and will not adversely affect the neighborhood.

4. Adequate and appropriate facilities for the removal of stormwater (drainage plans and calculations) will be provided after the applicant satisfies the requirements of the Town engineer as stated in the memos dated September 17, 2015.

5. Board of Health regulations have been satisfied and a Certificate of Compliance has been issued.

6. The applicant has agreed to improve signal timing and operations at the intersection of Routes 137 and 39, thereby mitigating impacts from the proposed development on traffic in the vicinity.

7. Additional screening along the easterly property line will provide a sufficient buffer for a sideline loading area.

8. The proposed vehicle access and egress on Route 39 and the internal traffic pattern will provide safety for vehicles and pedestrians.

Vote # 1: Waivers:
To approve the following the waivers based on the finding above:

1. **Section 325-40 – Loading Requirements:** located at the side of building instead of the rear of the building.

2. **Section 400-16.B.(3) – Landscape Plans:** none as the location is being heavily wooded with mature oaks and pines and existing trees in the perimeter buffers being retained.

3. **Section 400.17.B. – Drinking Water Protection District:** No additional requirements due to the extensive review and action by the Board of Health and the granting of a Certificate of Conformance governed by Groundwater Protection Regulations.

Vote # 2: Site Plan Review Special Permit: (requires a 2/3 vote of the Board)
To approve the Site Plan Special Permit for **Agway of Cape Cod** for the plan entitled "Site Plan – Proposed Building", dated July 14, 2015, revised July 31, 2015, revised September 2, 2015, and revised September 16, 2015, stamped by Stephanie J. Sequin, P.E., Ryder and Wilcox, Inc. based on the fact that the application meets the necessary requirements and criteria for approval pursuant to the Code of Town of Harwich with the findings and the following condition(s):

1. Additional plantings shall be placed near the easterly property line to screen the loading area from future development in the C-H-2 District.

2. Construction of a sidewalk along one side of the main entrance/exit from Route 39 to the building … (to be determined by the Planning Board).

3. Accessibility requirements shall meet the requirements of Harwich Code Chapter 208. The handicapped parking space shall be restriped in accordance with Appendix 3, Figure 10 of the Planning Board Rules and Regulations.

4. The drainage plan shall be revised in accordance with the Town Engineer's memorandum dated September 16, 2015.

5. A revised site plan including required changes from conditions #1 through #4 shall be presented to the Planning Department prior to or along with the as-built submittal requirement under §400.18.G.

6. In accordance with §325-44, the 10-space reserved parking area shall be reviewed on a periodic basis in order to monitor the adequacy of the constructed parking and the need to construct all or a portion of the reserve area. After such review, if appropriate, the Planning Board may require that all or a portion of the reserve area be actually constructed.

7. Subsequent to opening of the store, the applicant shall conduct an analysis of the Route 137/Route 39 intersection, including an updated traffic count, and shall implement any required changes in signal light timing. The timetable for the analysis shall be determined in consultation with Planning Staff.

8. Sight distances shall be maintained at all times through proper vegetation management consistent with review comments by safety officials.

9. Nursery yard inventories, product/merchandise or other materials and equipment, may not occupy designated parking or loading areas and are limited to the areas identified on the plan.

10. All outdoor lighting shall comply with the Harwich Zoning Code Article XXI.

11. All signage, including appropriate directional signage, shall meet and is subject to the requirement of the Article IV of the Harwich Zoning Code and the petitioner shall erect and maintain the following signage to ensure both pedestrian and vehicle safety.

12. Any changes or expansion to the following shall be subject to further Planning Board review:
    - parking areas or traffic patterns
    - outside storage of product inventory or displays.

Vote # 3: Use Special Permits

Motion to approve the use special permits pursuant to §325-9 and §325-13.D of the Harwich Zoning Code based on the findings above:

1. for 20+ parking spaces

2. Use Special Permit – Outdoor display of Retail Sales

Alternatively, the Planning Board may vote to continue the hearing to a date and time certain *(need to state reason or purpose)*.

Memo 1

To: David Spitz, Town Planner

From: Robert Cafarelli, Town Engineer

Date: September 17, 2015

Re: Agway Site Plan, 1405 Orleans Road

Engineering Department Review

Per your request, I offer the following comments on the Agway Site Plan located on 1405 Orleans Road dated September 1, 2015.

Drainage:

The site plan shows storm water infiltration areas of ADS Storm Tech SC-740 chambers. There are no details showing the number of chambers, how they are located, inlet inverts, etc. This should be included in the submission. There should also be documentation that the seasonal high ground water elevation is at least two feet below the bottom of each infiltration system.

Storm water run off was evaluated using the Hydro cad program which is pretty much the current industry standard for such evaluations. The post construction report details the run off from the 9 watersheds generated, but does not evaluate the adequacy of the proposed infiltration systems. The study should show that the infiltration systems can handle a 25 year storm with no surcharge, and that water is contained on site for 100 year events.

Since the site is located in the "drinking water resource protection overlay", consideration should be made to provide an additional pre treatment BMP in addition to the deep sump hooded catch basin prior to infiltration.

Memo 2

To: David Spitz, Town Planner

From: Robert Cafarelli, Town Engineer

Date: September 17, 2015

Re: Agway Site Plan, 1405 Orleans Road

Regarding my review of the proposed Agway site plan on 1405 Orleans Road, the entire site consists of Class A soils (Carver coarse sand), and is certainly large enough to incorporate a drainage system that can handle run off generated from the site.

Should all other factors of the site plan be acceptable, I would not be adverse for the Planning Board to approve the plan subject to approval of a drainage system acceptable to the Engineering Department.

Ryder & Wilcox
SURVEYING · ENGINEERING
HOME PLANNING & DESIGN

3 GIDDIAH HILL ROAD · P.O. BOX 439
SO. ORLEANS, MASSACHUSETTS 02662-0439
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September 17, 2015

David Spitz
Planning Dept.
732 Main Street
Harwich, MA 02645

Re: Agway of Cape Cod
1405 Orleans Road (Route 39)
(Assr's. Map 86 Pcl. M2-1)
Revised

Dear David,

As requested, I have prepared an alternative set of parking calculations. The proposed building will have approximately 3400 SF of retail space and 4800 SF of warehouse space. Agway anticipates up to 5 employees for the retail use, 4 employees for the warehouse, and 4 employees for the nursery.

Retail parking required:	3400 SF x 1 space/150 SF	= 23 spaces
Warehouse parking required:	4800 SF x 1 space/1000 SF	= 5 spaces
	4 employees x 1 space/emp.	= 4 spaces
Nursery parking required:	4 employees x 1 space/emp.	= 4 spaces
	Total	= 36 spaces

I have revised the Site Plan to show 5 employee spaces and 2 additional customer parking spaces in the gravel area adjacent to the bag storage. This brings the total number of proposed spaces to 39. I've also designated 10 reserve parking spaces, which could be constructed in the future if necessary.

Lastly, I have prepared a summary of the existing parking at the 3 existing Agway stores. I believe the Dennis store most closely corresponds to the proposed Harwich store as far as layout and services offered. Approximately 56% of the building is warehouse space; Harwich's warehouse is approximately 59%. The 21,500 SF Dennis store has 78 parking spaces. Assuming the same ratio of floor space to parking spaces, the 8200 SF Harwich store would need 30 spaces. Therefore, I believe the 39 spaces should be adequate for the proposed use.

I look forward to discussing these items with you. Thank you for your assistance. Please feel free to contact this office if you have any questions.

Sincerely,

Stephanie J. Sequin

Stephanie J. Sequin, P. E.

cc: Agway of Cape Cod

Job No. 11509

SUMMARY OF PARKING AREAS PREPARED FOR AGWAY OF CAPE COD
(REVISED)

LOCATION				
ORLEANS	RETAIL	4290 SF	6 EMPLOYEES	
	WAREHOUSE	5040 SF	5 EMPLOYEES	
	TOTAL	9330 SF		34 SPACES
	NURSERY	2370 SF	10 EMPLOYEES	
				24 SPACES + 10 OFF-SITE SPACES
DENNIS	RETAIL	8000 SF		
	WAREHOUSE	12,000 SF		
	GREEENHOUSE	1500 SF		
	TOTAL	21,500 SF	24 EMPLOYEES	68 SPACES + 10 OFF-SITE SPACES
CHATHAM	RETAIL	2000 SF		
	WAREHOUSE	1500 SF		
	GREENHOUSE	2000 SF		
	TOTAL	5500 SF	12 EMPLOYEES	35 SPACES + 8 GRASS SPACES + 8 OFF-SITE SPACES
HARWICH	RETAIL	3400 SF	5 EMPLOYEES	
	WAREHOUSE	4800 SF	4 EMPLOYEES	
	NURSERY		4 EMPLOYEES	
	TOTAL	8200 SF		39 SPACES + 10 RESERVE SPACES

Memorandum

To: Mr. Joshua Wile
Wiles, Inc.
P.O. Box 1129
South Dennis, MA 02536

Date: August 4, 2015

Project #: 13207.00

From: Randall C. Hart, Director of Transportation Planning & Engineering
Kathleen Keen, EIT

Re: Proposed Agway Retail Development
Harwich, Massachusetts

Introduction

VHB, Inc. has conducted a traffic impact and access study to assess the potential traffic impacts associated with the proposed Agway Retail development located at 1409 Route 39 in Harwich, Massachusetts. The proposed development project will include the construction of an approximately 8,200 sf retail building and approximately 30,088 sf of an ancillary outdoor product sales/storage area.

This memorandum includes an evaluation of the existing traffic operations and safety; assessment of future conditions without the project; an estimate of projected traffic volumes for the project; and its potential impact on future traffic operations in the area. As detailed herein, the proposed project is expected to have a minor impact on local traffic operations.

Site Location and Proposed Development

The project site is located on the southern side of Route 39 (Orleans-Harwich Road) just west of its intersection with Route 137 (Brewster-Chatham Road) in Harwich, Massachusetts. The site of the development is currently vacant and located directly adjacent to the existing Harwich East retail plaza. The proposed development will include the construction of an approximately 8,200 sf retail building and approximately 30,088 sf of an ancillary outdoor product sales/storage area. The proposed parking lot will consist of approximately 32 spaces. Under the proposed condition, there will be a single full-access driveway onto Route 39 and an exit-only driveway onto Route 39 approximately 160-feet east of the full-access driveway. The exit only driveway is proposed primarily to serve as an egress for delivery vehicles. A conceptual site plan is included in the Attachments to this memorandum.

Existing Conditions

The following sections provide a description of the existing study area roadway and intersection characteristics.

Study Area Roadways

VHB consulted with the Town of Harwich Planning Department prior to establishing a study are for the project. Informed by that discussion the study area and study area roadways are discussed below.

Route 39

Route 39 (Orleans-Harwich Road) is a northeast-southwest rural major collector under the Town of Harwich jurisdiction in the vicinity of the project site. Route 39 is a two-lane, undivided roadway with a posted speed limit of

101 Walnut Street
PO Box 9151
Watertown, MA 02472
P 617.924.1770

45 miles per hour (mph) within the vicinity of the site. There is a sidewalk on the southern side of Route 39 within the vicinity of the site. Land use consists of commercial uses east of the site and residential uses west of the site, with a cemetery located directly to the west of the site.

Study Area Intersections

For the purposes of evaluating existing and future traffic conditions in the vicinity of the site, a project study area has been established and includes three intersections. The study area intersections are described in detail below:

Route 39 at Route 137

Route 137 intersects Route 39 from the northwest and southeast to form a four-legged signalized intersection. All approaches are made up of an exclusive left-turn lane, though lane, and right-turn lane. Sidewalks exist on all corners or the intersection and crosswalks exist across all approaches. Land use near the intersection is primarily commercial uses.

Route 39 at Spences Trace/Evergreen Cemetery

Spences Trace intersects Route 39 from the northwest and the Evergreen Cemetery driveway intersects Route 39 from the southeast to form a four-legged unsignalized intersection. The Spences Trace and Evergreen Cemetery driveway approaches are under STOP control. All approaches are made up of a single general purpose lane accommodating all movements. A sidewalk exists on the southern side of Route 39 and no crosswalks exist at the intersection. Land use near the intersection consists of residential and cemetery uses.

Route 39 at Somerset Road

Somerset Road intersects Route 39 from the northwest to form a three-legged unsignalized intersection. The Somerset Road approach is under STOP control. All approaches are made up of a single general purpose lane accommodating all movements. A sidewalk exists on the southern side of Route 39 and no crosswalks exist at the intersection. Land use near the intersection consists of residential and cemetery uses.

Traffic Volumes

To assess the existing operational conditions at study area intersections, existing condition traffic volumes were collected during peak summer conditions when traffic is heaviest in this area. Automatic traffic recorder (ATR) counts were conducted from Thursday, July 9, 2015 through Saturday, July 11, 2015 along Route 39 in the vicinity of the site. The peak summer season traffic volume data are summarized below in Table 1 and the existing count data is included in the Attachments to this memorandum.

Table 1 Existing Peak Season Traffic Volume Summary

Location	Weekday Daily	Weekday Evening Peak Hour			Saturday Daily	Saturday Midday Peak Hour		
	Vol (vpd) [a]	Vol (vph) [b]	K Factor [c]	Dir. Dist.	Vol (vpd)	Vol (vph)	K Factor	Dir. Dist.
Route 39 east of Spences Trace	11,400	1,075	9.4%	55% WB	11,300	1,025	9.1%	50% WB

Source Automatic Traffic Recorder (ATR) counts conducted by VHB in July 2015.
a Daily traffic expressed in vehicles per day.
b Peak hour volumes expressed in vehicles per hour.
c Percent of daily traffic, which occurs during the peak hour.

As shown in Table 1, Route 39 carries approximately 11,400 vehicles per day on a typical weekday, with 9.4-percent during the weekday evening peak hour, and carries approximately 11,300 vehicles per day on a typical Saturday, with 9.1-percent during the Saturday midday peak hour. Route 39 traffic is slightly heavier in the westbound direction during the weekday evening peak hour and approximately even during the Saturday midday peak hour.

In addition, peak hour turning movement counts (TMCs) were conducted concurrent with the ATR counts at the study area intersections in July 2015 during the weekday evening peak period from 4:00 PM to 6:00 PM and during the Saturday midday peak period from 11:00 AM to 1:00 PM. Based on a review of the count data, the weekday evening and Saturday midday peak hours of vehicular activity were determined to be 4:00 PM to 5:00 PM and 11:00 AM to 12:00 PM, respectively. The traffic volume counts are provided in the Attachments to this memorandum.

Seasonal Variation

According to the 2011 seasonal adjustment factors provided by the Cape Cod Commission in the *2013 Traffic Counting Report for Cape Cod Massachusetts*, traffic volumes in July represent peak summer season conditions. This report also shows that July counts are approximately 24-percent higher than average annual month conditions. As such, no seasonal adjustment factor was applied. The seasonal adjustment factors are included in the Attachments to this memorandum. The TMCs were used to develop the existing weekday evening and Saturday midday peak hour traffic volume networks. The traffic volume networks and all traffic count data conducted for this assessment are included in the Attachments to this memorandum.

Crash Summary

To identify potential vehicle crash trends in the study area, vehicular crash data for the study area intersections were obtained from Massachusetts Department of Transportation (MassDOT) for the most recent five-year period (2009-2013) available. A summary of the MassDOT vehicular crash history is provided in Table 2 and the detailed crash data is provided in the Attachments to this memorandum.

The current MassDOT average crash rates for signalized and unsignalized intersections in District 5 (the MassDOT district for Harwich) are 0.77 crashes per million entering vehicles and 0.58 crashes per million entering vehicles, respectively. In other words, on average, 0.77 crashes occurred per million vehicles entering signalized intersections,

and 0.58 crashes occurred per million vehicles entering unsignalized intersections throughout District 5. The crash rate worksheets are included in the Attachments to this memorandum.

As shown in Table 2, two of the study area intersections had no reported crashes over the five-year period. Crashes were reported at the intersection of Route 39 at Route 137. The majority of crashes that occurred at this intersection were angle and rear-end collisions resulting in property damage only. None of the crashes involved a non-motorist (bike, pedestrian) or resulted in fatal injuries. The calculated crash rates at all the study area intersections are below the MassDOT District 5 average crash rates.

Table 2 Vehicular Crash Data (2009 - 2013)

	Route 39 at Route 137	Route 39 at Spences Trace	Route 39 at Somerset Road
Signalized?	Yes	No	No
MassDOT Average Crash Rate	0.77	0.58	0.58
Calculated Crash Rate	0.48	0.00	0.00
Exceeds Average Crash Rate?	No	No	No
Year			
2009	10	0	0
2010	1	0	0
2011	3	0	0
2012	6	0	0
2013	3	0	0
Total	23	0	0
Average	4.60	0.00	0.00
Collision Type			
Angle	11	0	0
Head-on	1		
Rear-end	9	0	0
Sideswipe, opposite direction	1	0	0
Single vehicle crash	1		
Crash Severity			
Fatal injury	0	0	0
Non-fatal injury	8	0	0
Property damage only (none injured)	15	0	0
Time of Day			
Weekday, 7:00 AM - 9:00 AM	1	0	0
Weekday, 4:00 PM - 6:00 PM	4	0	0
Saturday, 11:00 AM - 2:00 PM	5	0	0
Weekday, other time	9	0	0
Weekend, other time	4	0	0
Pavement Conditions			
Dry	19	0	0
Wet	3	0	0
Snow	1		
Non-Motorist (Bike, Pedestrian)	0	0	0

Source MassDOT vehicle crash data

Future Conditions

To determine the impacts of the site-generated traffic volumes in the vicinity of the site, future traffic conditions were evaluated. A seven-year horizon (2022) was used for the evaluation consistent with MassDOT TIA requirements.

Traffic growth on area roadways is a function of the expected land development, environmental activity, and changes in demographics. A frequently used procedure is to identify estimated traffic generated by planned developments that would be expected to affect the project study area roadways. An alternative procedure is to estimate an annual percentage increase and apply that increase to study area traffic volumes. For this evaluation, ***both*** procedures were used. The following summarizes this traffic forecasting process.

Historic Growth

A review of historic data published in the *2013 Traffic Counting Report for Cape Cod Massachusetts* indicates that traffic has decreased at a rate of 0.52-percent per year Cape-wide over the last ten years (2003-2013). As described in this report, the Town of Harwich is considered to be part of the Lower Cape region, in which traffic decreased at a rate of 0.82-percent per year between 2003 and 2013. To provide a conservative analysis, a growth rate of one-percent per year was used. The historic growth data is provided in the Attachments to this memorandum.

Site Specific Growth

In addition to accounting for background growth, the traffic associated with other planned and/or approved developments near the site was considered. Based on discussions with the Town of Harwich, it was determined that there are no projects that are currently under consideration in the vicinity of the site that are likely to influence traffic conditions.

Background Transportation Projects

In assessing future traffic conditions, proposed roadway improvements within the study area were considered. Based on discussions with the Town of Harwich, there are no transportation projects that would impact the project study area within the seven-year horizon.

No-Build Traffic Volumes

The 2022 No-Build traffic volumes were generated by consideration of the above described factors. The resulting 2022 No-Build peak hour traffic volume networks are provided in the Attachments to this memorandum.

Trip Generation

The proposed development would involve the construction of an approximately 8,200 sf retail building and approximately 30,088 sf of an ancillary outdoor product sales/storage area. To estimate the site-generated traffic, the Institute of Transportation Engineers' (ITE) publication *Trip Generation, 9th Edition*[1] was utilized. The number of vehicle

1 Trip Generation Manual, 9th Edition, Institute of Transportation Engineers, Washington D.C., 2012.

trips generated by the proposed project were estimated based on ITE land use code (LUC) 826 (Specialty Retail). The trip generation worksheet is included in the Attachments to this memorandum.

It should be noted that not all trips associated with the proposed project will represent "new" traffic added to the study area roadways. A portion of the vehicle trips generated will be drawn from the existing traffic passing the site in the form of pass-by traffic. A pass-by trip percentage of 25-percent was used for the proposed development which is accordance with MassDOT TIA guidelines. A summary of the trip generation breakdown is provided in Table 3.

Table 3 Trip Generation Summary

Time Period	Movement	Proposed Agway Retail [a]	Pass-By Trips [b]	Net New Trips
Weekday Daily		1,696	424	1,272
Weekday Evening	Enter	108	24	84
Peak Hour	Exit	85	24	61
	Total	193	48	145
Saturday Daily		1,610	402	1,208
Saturday Midday	Enter	102	23	79
Peak Hour	Exit	80	23	57
	Total	182	46	136

a Trip generation estimate based on ITE LUC 826 (Specialty Retail) for 38,288 sf of space
b Pass-by trip percentage of 25-percent

Based on the projections outlined above, the proposed project is expected to increase vehicle trips to the site by approximately 145 (84 entering/61 exiting) vehicle trips during the weekday evening peak hour and approximately 136 (79 entering/57 exiting) vehicle trips during the Saturday midday peak hour.

Trip Distribution

The directional distribution of traffic approaching and departing the site is a function of several variables. These include population densities, existing travel patterns, and the efficiency of the roadways leading to and from the site. The trip distribution of the site traffic is based on existing travel patterns along Route 39. The trip distribution patterns for the project are presented in Table 4 and provided as a figure in the Attachments to this memorandum.

Table 4 Trip Distribution

Travel Route	Direction (to/from)	Percent of New Site-Generated Traffic Assigned to Route
Route 39	West	45%
Route 39	East	27%
Route 137	North	19%
Route 137	South	9%
Total		100%

Build Traffic Volumes

The project-related traffic volumes shown in Table 3 are assigned to the study area roadway network based on the trip distribution patterns shown in Table 4 and added to the 2022 No-Build peak hour traffic volume networks to develop the 2022 Build peak hour traffic volume networks. The 2022 Build peak hour traffic volume networks and the project-generated traffic volume networks are provided in the Attachments to this memorandum.

Traffic Operations Analysis

To assess quality of flow, intersection capacity analyses were conducted with respect to 2015 Existing, 2022 No-Build, and 2022 Build traffic volume conditions. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them. Roadway operating conditions are classified by calculated levels-of-service.

The evaluation criteria used to analyze area intersections and roadways in this traffic study are based on the *2010 Highway Capacity Manual* (HCM)[2]. Level–of-service (LOS) is the term used to denote the different operating conditions that occur on a given roadway segment under various traffic volume loads. It is a qualitative measure that considers a number of factors including roadway geometry, speed, travel delay, freedom to maneuver, and safety. Level-of-service provides an index to operational qualities of a roadway segment or an intersection. Level-of-service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

Intersection Capacity Analysis

Levels-of-service analyses were conducted for the 2015 Existing, 2022 No-Build, and 2022 Build conditions for the study area intersections. Tables 5 and 6 summarize the capacity analysis results for the signalized and unsignalized

[2] Highway Capacity Manual, Transportation Research Board, Washington D.C., 2010.

study area intersections, respectively. The capacity analyses worksheets are included in the Attachments to this memorandum.

As shown in Tables 5 and 6, the project is expected to have minimal impacts on traffic operations at the study area intersections. All of the study area intersections currently operate at LOS D or better during both peak hours and are expected to continue to operate at LOS D or better under 2022 No-Build and 2022 Build conditions. Additionally, the two proposed site driveways are expected to operate at LOS D or better under the 2022 Build condition during both peak hours.

Table 5 Signalized Intersection Capacity Analysis

		2015 Existing Conditions					2022 No-Build Conditions					2022 Build Conditions				
Location	Movement	v/c [a]	Del [b]	LOS [c]	50 Q [d]	95 Q [e]	v/c	Del	LOS	50 Q	95 Q	v/c	Del	LOS	50 Q	95 Q
Route 39 at Route 137																
Weekday	EB L	1.02	109	F	~153	#285	>1.20	>120	F	~171	#308	>1.20	>120	F	~182	#322
Evening	EB T	0.48	27	C	131	187	0.62	32	C	141	198	0.62	31	C	147	204
	EB R	0.10	3	A	0	17	0.12	3	A	0	19	0.13	3	A	0	21
	WB L	0.41	44	D	28	65	0.44	45	D	31	69	0.44	45	D	31	69
	WB T	0.73	39	D	140	197	0.74	38	D	149	208	0.76	38	D	161	221
	WB R	0.31	6	A	0	36	0.32	6	A	2	40	0.31	6	A	2	39
	NB L	0.36	15	B	30	69	0.41	16	B	34	76	0.46	18	B	36	82
	NB T	0.57	19	B	159	297	0.58	19	B	179	333	0.60	21	C	185	343
	NB R	0.10	3	A	0	19	0.10	3	A	0	22	0.10	3	A	0	22
	SB L	0.51	33	C	60	#168	0.57	36	D	67	#193	0.59	38	D	69	#193
	SB T	0.73	35	C	198	#438	0.80	40	D	222	#493	0.83	43	D	228	#493
	SB R	0.37	8	A	14	77	0.41	9	A	20	92	0.44	9	A	22	96
	Overall		**31**	**C**				**49**	**D**				**53**	**D**		
Saturday	EB L	0.88	79	E	~108	#244	>1.20	>120	F	~139	#259	>1.20	>120	F	~151	#274
Midday	EB T	0.52	27	C	142	196	0.60	30	C	154	206	0.62	30	C	161	215
	EB R	0.12	3	A	0	21	0.13	3	A	0	20	0.14	3	A	0	21
	WB L	0.37	43	D	24	57	0.42	46	D	27	62	0.42	46	D	27	62
	WB T	0.70	38	D	127	182	0.71	37	D	136	192	0.73	37	D	146	204
	WB R	0.31	6	A	0	36	0.33	6	A	2	40	0.32	6	A	2	40
	NB L	0.32	14	B	28	64	0.35	15	B	31	71	0.37	15	B	33	75
	NB T	0.45	17	B	122	223	0.46	16	B	130	247	0.47	17	B	134	253
	NB R	0.09	2	A	0	15	0.09	3	A	0	18	0.09	3	A	0	18
	SB L	0.45	30	C	52	#133	0.47	31	C	57	#160	0.47	32	C	58	#162
	SB T	0.74	36	D	182	#399	0.75	36	D	201	#454	0.76	38	D	205	#457
	SB R	0.32	7	A	6	59	0.33	8	A	11	**70**	0.36	8	A	13	74
	Overall		**27**	**C**				**38**	**D**				**44**	**D**		

a. Volume to capacity ratio.
b. Average total delay, in seconds per vehicle.
c. Level-of-service.
d. 50th percentile queue, in feet.
e. 95th percentile queue, in feet.
~ Volume exceeds capacity, queue is theoretically infinite.
# 95th percentile volume exceeds capacity, queue may be longer.

Table 6 Unsignalized Intersection Capacity Analysis

		2015 Existing Conditions					2022 No-Build Conditions					2022 Build Conditions				
Location	Movement	D [a]	v/c [b]	Del [c]	LOS [d]	95 Q [e]	D	v/c	Del	LOS	95 Q	D	v/c	Del	LOS	95 Q
Route 39 at Spences Trace																
Weekday	EB L	neg	-	0	A	0	neg	-	0	A	0	neg	-	0	A	0
Evening	WB L	neg	0.00	9	A	0	neg	0.00	9	A	0	neg	0.00	9	A	0
	NB L/T/R	neg	0.03	28	D	1	neg	0.03	32	D	1	neg	0.03	35	D	1
	SB L/T/R	neg	0.03	28	D	1	neg	0.03	32	D	1	neg	0.03	35	D	1
Saturday	EB L	neg	0.00	9	A	0	neg	0.00	9	A	0	neg	0.00	9	A	0
Midday	WB L	neg	-	0	A	0	neg	-	0	A	0	neg	-	0	A	0
	NB L/T/R	neg	0.02	24	C	1	neg	0.02	26	D	1	neg	0.03	29	D	1
	SB L/T/R	neg	0.03	20	C	1	neg	0.04	22	C	1	neg	0.04	23	C	1
Route 39 at Somerset Road																
Weekday	WB L	5	0.01	9	A	0	5	0.01	9	A	0	5	0.01	9	A	0
Evening	NB L/R	5	0.03	14	B	1	5	0.03	14	B	1	5	0.03	15	C	1
Saturday	WB L	neg	0.00	9	A	0	neg	0.00	9	A	0	neg	0.00	9	A	0
Midday	NB L/R	neg	0.02	16	C	1	neg	0.03	17	C	1	neg	0.03	18	C	1
Route 39 at Site Driveway West																
Weekday	WB L											60	0.07	9	A	1
Evening	NB L/R											75	0.37	31	D	2
		Intersection does not exist					*Intersection does not exist*									
Saturday	WB L											55	0.06	9	A	1
Midday	NB L/R											75	0.32	26	D	2
Route 39 at Site Driveway East																
Weekday	NB L/R											10	0.05	20	C	1
Evening																
		Intersection does not exist					*Intersection does not exist*									
Saturday	NB L/R											10	0.04	19	C	1
Midday																

a. Demand of critical movement.
b. Volume to capacity ratio.
c. Average total delay, in seconds per vehicle.
d. Level-of-service.
e. 95th percentile queue, in vehicles.

Site Access and Circulation

Access to the site under the proposed condition will be provided by a single full-access driveway onto Route 39 and an exit-only driveway onto Route 39 approximately 160-feet east of the full-access driveway which is proposed primarily to serve as an egress for delivery vehicles. Both of the proposed driveways will consist of a single approach lane accommodating all movements. The proposed parking lot will be located along the full-access driveway just south of Route 39 and will consist of approximately 32 spaces and a customer pick-up area on the western side of the proposed building. The driveway will loop the site to connect with the exit-only driveway to the east of the full-access driveway. The exit-only driveway is anticipated to be used primarily by delivery trucks leaving the loading area on the eastern side of the proposed building.

Sight Distance

A sight distance analysis, in conformance with guidelines of the American Association of State Highway and Transportation Officials (AASHTO)[3] was performed at the location of the two unsignalized site driveways. Sight distance considerations are generally divided into two categories: Stopping Sight Distance (SSD) and Intersection Sight Distance (ISD).

SSD is the distance required for a vehicle approaching an intersection from either direction to perceive, react, and come to a complete stop before colliding with an object in the road, in this case the exiting vehicle from a driveway. In this respect, SSD can be considered as the minimum visibility criterion for the safe operation of an unsignalized intersection.

ISD is based on the time required for perception, reaction, and completion of the desired critical exiting maneuver once the driver on a minor street or driveway approach decided to execute the maneuver. Calculation for the critical ISD includes the time to (1) turn left, and to clear the half of the intersection without conflicting with the vehicles approaching from the left; and (2) accelerate to the operating speed of the roadway without causing approaching vehicles to unduly reduce their speed. In this context, ISD can be considered as a desirable visibility criterion for the safe operation of an unsignalized intersection. Essentially, while SSD is the minimum distance needed to avoid collisions, ISD is the minimum distance needed so that mainline motorists will not have to substantially reduce their speed due to turning vehicles. To maintain the safe operation of an unsignalized intersection, ISD only needs to be equal to SSD, though it is desirable to meet ISD requirements by themselves.

To calculate the required SSD and ISD at the egress-only unsignalized site driveway along Hinckley Road, the 85th percentile speed data was used. The 85th percentile speed data was collected in July 2015 using automatic traffic recorder (ATR) counts and is included in the Attachments to this memorandum. The 85th percentile speed along Route 39 is 41 mph in the eastbound direction and 42 mph in the westbound direction within the vicinity of the project site. Table 7 summarizes the sight distance analysis and sight distance worksheets are included in the Attachments to this memorandum.

[3] A Policy on the Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials, 2011.

Table 7 Sight Distance Analysis Summary

Location	Stopping Sight Distance			Intersection Sight Distance		
	Traveling	Required (ft)	Measured (ft)	Looking	Desired (ft)	Measured (ft)
Full-Access West Driveway at Route 39 [a]	Eastbound	315	500+	Left	465	500+
	Westbound	325	500+	Right	465	500+
Full-Access West Driveway at Route 39 [a]	Eastbound	315	500+	Left	465	500+
	Westbound	325	500+	Right	465	500+

Source Based on guidelines established in A Policy on the Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials [AASHTO], 2011

a Speeds are based on the 85th percentile speed of 41 mph in the eastbound direction and 42 mph in the westbound direction

As shown in Table 7, the required SSD and desired ISD is exceeded in both directions at both the proposed site driveways on Route 39.

Conclusions

VHB has conducted a traffic impact study for the proposed Agway Retail development located at 1409 Route 39 in Harwich, Massachusetts. The proposed development project will include the construction of an approximately 8,200 sf retail building and approximately 30,088 sf of an ancillary outdoor product sales/storage area. Access to the proposed site will be provided by a full-access driveway onto Route 39 and an exit-only driveway onto Route 39 approximately 160-feet east of the full-access driveway.

The proposed redevelopment is expected to increase vehicle trips to the site by approximately 145 (84 entering/61 exiting) vehicle trips during the weekday evening peak hour and approximately 136 (79 entering/57 exiting) trips during the Saturday midday peak hour.

An evaluation of available sight distance at the egress-only site driveway was conducted. It was determined that there is adequate stopping and intersection sight distance at this location.

Based on the intersection capacity analysis, it was determined that the project will have minimal impact upon intersection operations at the existing study area intersections. The proposed site driveways are expected to operate at LOS D or better during both peak hours.

Attachments

- Proposed Site Plan
- Traffic Volume Count Data
- Seasonal Adjustment Factors
- 2015 Existing Conditions Traffic Volume Networks
- Vehicular Crash Data
- Historic Traffic Growth
- 2022 No-Build Conditions Traffic Volume Networks
- Trip Generation
- Trip Distribution
- 2022 Build Conditions Traffic Volume Networks
- Intersection Capacity Analyses
- Sight Distance Worksheets

Proposed Site Plan

RECORD OWNER

LEIGH W. MCKENNEY TRUSTEE
C/O CYNTHIA ELDREDGE
9 FORSYTHIA DR.
HARWICH, MA 02645

APPLICANT

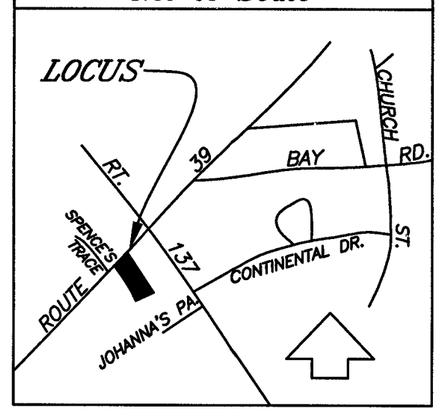
AGWAY OF CAPE COD
PO BOX 1129
S. DENNIS, MA 02660

CURRENT ZONING

COMMERCIAL – HIGHWAY 2 (CH–2)
DRINKING WATER RESOURCE PROT. DIST. (WR)

LOCATION MAP

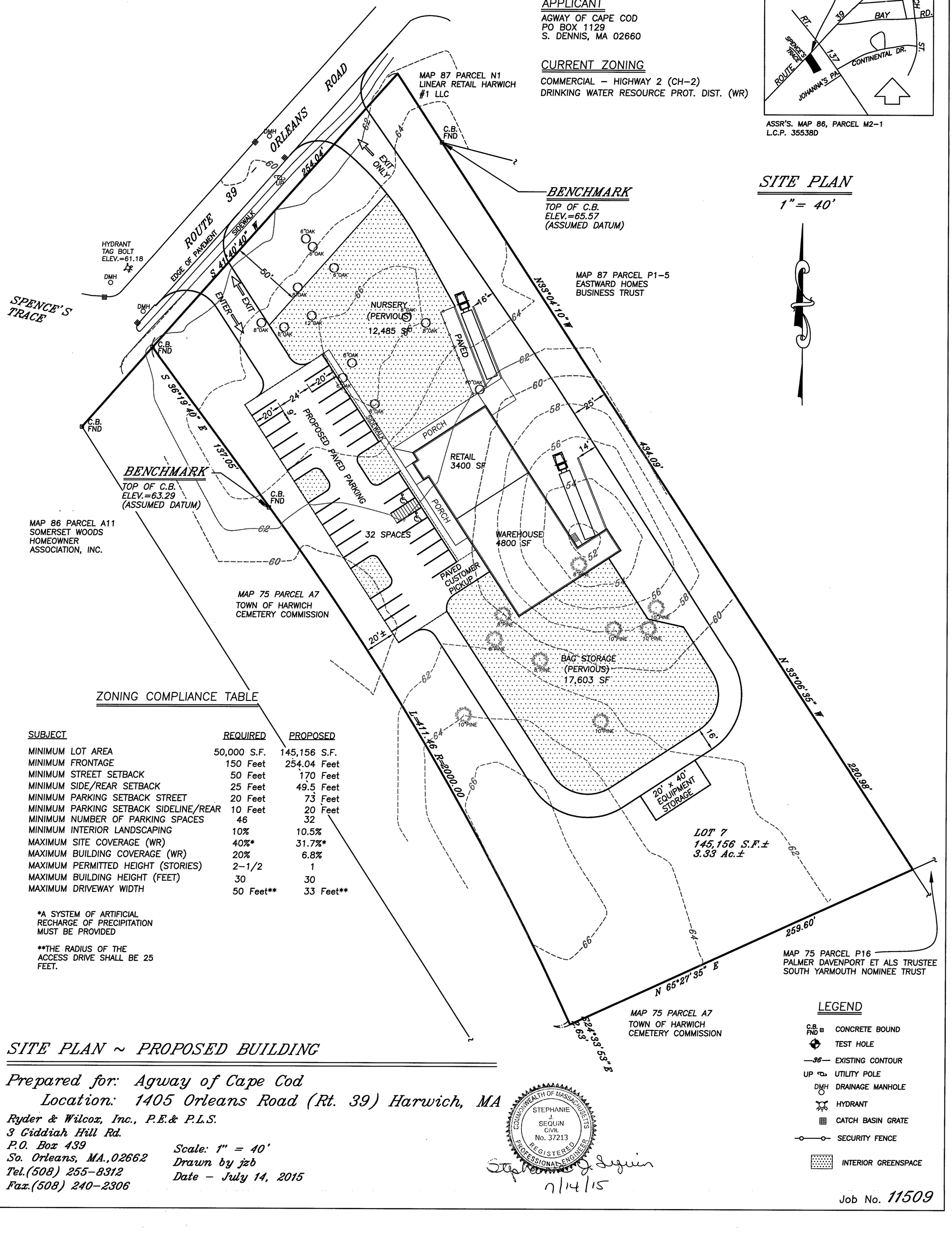
Not to Scale



ASSR'S. MAP 86, PARCEL M2–1
L.C.P. 35538D

SITE PLAN

1" = 40'



ZONING COMPLIANCE TABLE

SUBJECT	REQUIRED	PROPOSED
MINIMUM LOT AREA	50,000 S.F.	145,156 S.F.
MINIMUM FRONTAGE	150 Feet	254.04 Feet
MINIMUM STREET SETBACK	50 Feet	170 Feet
MINIMUM SIDE/REAR SETBACK	25 Feet	49.5 Feet
MINIMUM PARKING SETBACK STREET	20 Feet	73 Feet
MINIMUM PARKING SETBACK SIDELINE/REAR	10 Feet	20 Feet
MINIMUM NUMBER OF PARKING SPACES	46	32
MINIMUM INTERIOR LANDSCAPING	10%	10.5%
MAXIMUM SITE COVERAGE (WR)	40%*	31.7%*
MAXIMUM BUILDING COVERAGE (WR)	20%	6.8%
MAXIMUM PERMITTED HEIGHT (STORIES)	2–1/2	1
MAXIMUM BUILDING HEIGHT (FEET)	30	30
MAXIMUM DRIVEWAY WIDTH	50 Feet**	33 Feet**

*A SYSTEM OF ARTIFICIAL RECHARGE OF PRECIPITATION MUST BE PROVIDED

**THE RADIUS OF THE ACCESS DRIVE SHALL BE 25 FEET.

LEGEND

- C.B. FND — CONCRETE BOUND
- TEST HOLE
- —36— EXISTING CONTOUR
- UP — UTILITY POLE
- DMH — DRAINAGE MANHOLE
- HYDRANT
- CATCH BASIN GRATE
- SECURITY FENCE
- INTERIOR GREENSPACE

SITE PLAN ~ PROPOSED BUILDING

Prepared for: Agway of Cape Cod
Location: 1405 Orleans Road (Rt. 39) Harwich, MA

Ryder & Wilcox, Inc., P.E.& P.L.S.
3 Giddiah Hill Rd.
P.O. Box 439
So. Orleans, MA.,02662
Tel.(508) 255–8312
Fax.(508) 240–2306

Scale: 1" = 40'
Drawn by jzb
Date – July 14, 2015

COMMONWEALTH OF MASSACHUSETTS
STEPHANIE J. SEQUIN
CIVIL
No. 37213
REGISTERED PROFESSIONAL ENGINEER

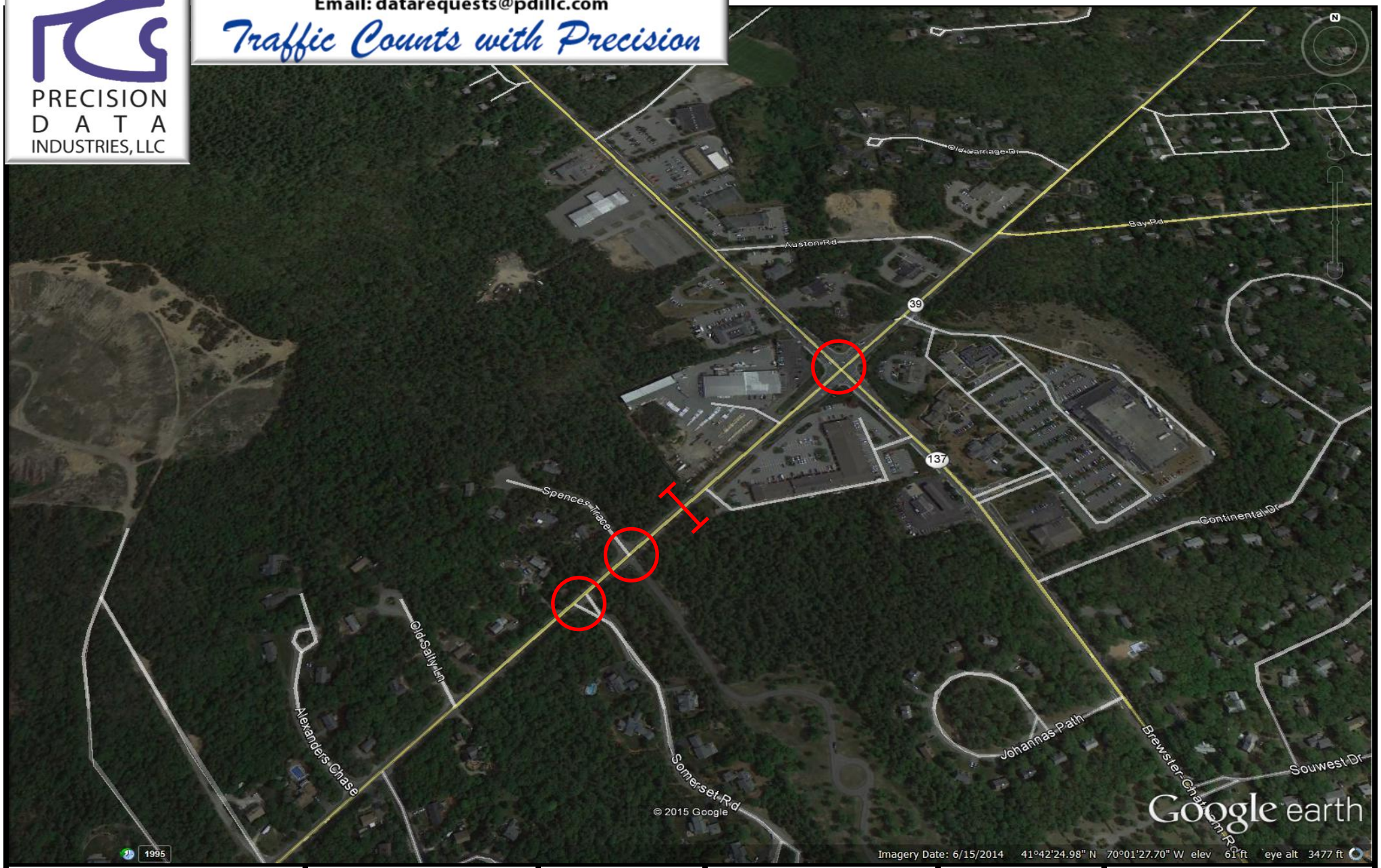
7/14/15

Job No. *11509*

Traffic Volume Count Data

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision



Client:	Engineer:	Site Code:	Date:	PDI Job Number:	City, State:
VHB	K. Keen	82600.15	Thurs 7/9 thru Sat 7/11/2015	154558	Harwich, MA

Orleans-Harwich Road (Route 39)
east of Spences Trace
City, State: Harwich, MA
Client: VHB/ K. Keen

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

154558 A VOLUME
Site Code: 8200.15

Start	EB				WB				Combined				09-Jul-15
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	4		108		8		108		12		216		
12:15	4		119		11		97		15		216		
12:30	3		93		6		104		9		197		
12:45	4	15	112	432	7	32	117	426	11	47	229	858	
01:00	2		98		3		117		5		215		
01:15	3		74		3		96		6		170		
01:30	1		99		0		110		1		209		
01:45	2	8	81	352	1	7	97	420	3	15	178	772	
02:00	4		70		3		118		7		188		
02:15	1		103		3		95		4		198		
02:30	1		102		3		107		4		209		
02:45	0	6	127	402	0	9	139	459	0	15	266	861	
03:00	2		97		2		137		4		234		
03:15	2		111		1		120		3		231		
03:30	1		108		1		117		2		225		
03:45	2	7	107	423	1	5	157	531	3	12	264	954	
04:00	3		135		1		137		4		272		
04:15	4		121		4		144		8		265		
04:30	3		119		2		147		5		266		
04:45	8	18	108	483	1	8	163	591	9	26	271	1074	
05:00	2		121		4		134		6		255		
05:15	14		106		5		136		19		242		
05:30	12		108		8		111		20		219		
05:45	12	40	85	420	5	22	117	498	17	62	202	918	
06:00	21		68		11		95		32		163		
06:15	27		78		19		88		46		166		
06:30	28		66		40		68		68		134		
06:45	61	137	60	272	31	101	55	306	92	238	115	578	
07:00	54		83		42		71		96		154		
07:15	75		68		45		59		120		127		
07:30	89		60		53		56		142		116		
07:45	95	313	36	247	72	212	57	243	167	525	93	490	
08:00	87		49		59		53		146		102		
08:15	92		40		66		48		158		88		
08:30	79		30		82		46		161		76		
08:45	108	366	49	168	96	303	41	188	204	669	90	356	
09:00	94		44		65		45		159		89		
09:15	102		23		93		58		195		81		
09:30	99		26		66		37		165		63		
09:45	107	402	22	115	97	321	32	172	204	723	54	287	
10:00	70		26		95		29		165		55		
10:15	101		25		95		29		196		54		
10:30	96		11		87		22		183		33		
10:45	119	386	16	78	104	381	21	101	223	767	37	179	
11:00	96		12		102		13		198		25		
11:15	127		8		93		11		220		19		
11:30	112		9		125		12		237		21		
11:45	109	444	6	35	103	423	10	46	212	867	16	81	
Total	2142		3427		1824		3981		3966		7408		
Percent	54.0%		46.3%		46.0%		53.7%						
Day Total		5569				5805				11374			
Peak	10:45	-	04:00	-	10:45	-	04:00	-	10:45	-	04:00	-	-	-
Vol.	454	-	483	-	424	-	591	-	878	-	1074	-	-	-
P.H.F.	0.894		0.894		0.848		0.906		0.926		0.987			

Orleans-Harwich Road (Route 39)
east of Spences Trace
City, State: Harwich, MA
Client: VHB/ K. Keen

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

154558 A VOLUME
Site Code: 8200.15

Start	EB				WB				Combined				10-Jul-15
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Fri
12:00	3		132		6		134		9		266		
12:15	5		135		1		107		6		242		
12:30	7		122		5		104		12		226		
12:45	1	16	104	493	6	18	136	481	7	34	240	974	
01:00	3		108		7		130		10		238		
01:15	7		103		8		108		15		211		
01:30	2		115		3		140		5		255		
01:45	2	14	121	447	4	22	113	491	6	36	234	938	
02:00	1		108		7		100		8		208		
02:15	1		105		0		122		1		227		
02:30	1		112		0		133		1		245		
02:45	1	4	141	466	1	8	116	471	2	12	257	937	
03:00	1		120		2		107		3		227		
03:15	1		115		1		120		2		235		
03:30	2		122		1		115		3		237		
03:45	4	8	117	474	0	4	136	478	4	12	253	952	
04:00	2		112		2		119		4		231		
04:15	3		132		1		116		4		248		
04:30	4		135		2		143		6		278		
04:45	4	13	115	494	3	8	134	512	7	21	249	1006	
05:00	4		127		3		136		7		263		
05:15	15		113		6		145		21		258		
05:30	9		98		12		123		21		221		
05:45	23	51	96	434	8	29	117	521	31	80	213	955	
06:00	16		90		14		102		30		192		
06:15	25		80		28		97		53		177		
06:30	37		80		27		83		64		163		
06:45	51	129	74	324	31	100	101	383	82	229	175	707	
07:00	48		76		35		73		83		149		
07:15	58		62		54		76		112		138		
07:30	58		71		60		75		118		146		
07:45	98	262	48	257	68	217	54	278	166	479	102	535	
08:00	61		58		67		62		128		120		
08:15	100		58		70		51		170		109		
08:30	95		40		73		52		168		92		
08:45	115	371	49	205	91	301	54	219	206	672	103	424	
09:00	102		46		73		37		175		83		
09:15	96		56		95		43		191		99		
09:30	111		40		98		31		209		71		
09:45	124	433	23	165	109	375	41	152	233	808	64	317	
10:00	112		33		101		33		213		66		
10:15	111		26		107		35		218		61		
10:30	103		20		107		37		210		57		
10:45	123	449	22	101	102	417	32	137	225	866	54	238	
11:00	101		26		131		19		232		45		
11:15	120		17		88		24		208		41		
11:30	118		7		110		18		228		25		
11:45	158	497	11	61	114	443	12	73	272	940	23	134	
Total	2247		3921		1942		4196		4189		8117		
Percent	53.6%		48.3%		46.4%		51.7%						
Day Total		6168				6138				12306			
Peak	11:00	-	04:15	-	10:15	-	04:30	-	11:00	-	04:30	-	-	-
Vol.	497	-	509	-	447	-	558	-	940	-	1048	-	-	-
P.H.F.	0.786		0.943		0.853		0.962		0.864		0.942			

Orleans-Harwich Road (Route 39)
east of Spences Trace
City, State: Harwich, MA
Client: VHB/ K. Keen

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

154558 A VOLUME
Site Code: 8200.15

Start	EB				WB				Combined				11-Jul-15
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sat
12:00	9		89		18		121		27		210		
12:15	8		118		6		113		14		231		
12:30	9		118		7		115		16		233		
12:45	11	37	110	435	5	36	98	447	16	73	208	882	
01:00	4		87		16		91		20		178		
01:15	5		125		7		114		12		239		
01:30	7		87		5		108		12		195		
01:45	8	24	103	402	3	31	102	415	11	55	205	817	
02:00	0		108		4		94		4		202		
02:15	2		113		1		105		3		218		
02:30	2		100		1		93		3		193		
02:45	3	7	116	437	7	13	94	386	10	20	210	823	
03:00	3		101		0		98		3		199		
03:15	2		111		2		119		4		230		
03:30	0		93		0		91		0		184		
03:45	3	8	89	394	0	2	98	406	3	10	187	800	
04:00	2		97		1		85		3		182		
04:15	5		109		1		93		6		202		
04:30	4		89		1		116		5		205		
04:45	4	15	91	386	2	5	94	388	6	20	185	774	
05:00	2		96		0		103		2		199		
05:15	6		83		3		105		9		188		
05:30	12		93		9		70		21		163		
05:45	15	35	85	357	7	19	73	351	22	54	158	708	
06:00	12		95		9		108		21		203		
06:15	18		67		11		80		29		147		
06:30	38		72		15		73		53		145		
06:45	47	115	90	324	22	57	91	352	69	172	181	676	
07:00	45		71		29		57		74		128		
07:15	36		69		37		61		73		130		
07:30	69		52		29		66		98		118		
07:45	78	228	57	249	54	149	54	238	132	377	111	487	
08:00	69		51		50		57		119		108		
08:15	76		39		68		46		144		85		
08:30	83		38		82		48		165		86		
08:45	95	323	41	169	83	283	45	196	178	606	86	365	
09:00	107		32		79		48		186		80		
09:15	106		41		98		36		204		77		
09:30	123		27		111		36		234		63		
09:45	129	465	25	125	121	409	35	155	250	874	60	280	
10:00	136		27		122		35		258		62		
10:15	137		26		133		41		270		67		
10:30	99		23		129		27		228		50		
10:45	136	508	19	95	127	511	33	136	263	1019	52	231	
11:00	139		25		125		36		264		61		
11:15	129		14		112		37		241		51		
11:30	118		14		139		19		257		33		
11:45	116	502	12	65	111	487	12	104	227	989	24	169	
Total	2267		3438		2002		3574		4269		7012		
Percent	53.1%		49.0%		46.9%		51.0%						
Day Total		5705				5576				11281			
Peak	09:30	-	00:30	-	10:15	-	12:00	-	10:15	-	12:00	-	-	-
Vol.	525	-	440	-	514	-	447	-	1025	-	882	-	-	-
P.H.F.	0.958		0.880		0.966		0.924		0.949		0.946			

Orleans-Harwich Road (Route 39)
east of Spences Trace
City, State: Harwich, MA
Client: VHB/ K. Keen

PRECISION
D A T A
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Office: 508.481.3999 Fax: 508.545.1234
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154558 A Class
Site Code: 8200.15

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/09/1														
5	0	14	0	0	1	0	0	0	0	0	0	0	0	15
01:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
02:00	0	3	2	0	0	0	0	1	0	0	0	0	0	6
03:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
04:00	0	13	3	0	2	0	0	0	0	0	0	0	0	18
05:00	0	31	8	0	1	0	0	0	0	0	0	0	0	40
06:00	0	86	41	0	10	0	0	0	0	0	0	0	0	137
07:00	1	197	89	1	16	0	0	8	1	0	0	0	0	313
08:00	0	250	92	2	14	2	0	4	2	0	0	0	0	366
09:00	1	294	88	0	14	2	0	2	0	0	1	0	0	402
10:00	4	274	87	2	16	2	0	1	0	0	0	0	0	386
11:00	0	329	90	3	12	6	0	4	0	0	0	0	0	444
12 PM	2	318	88	2	17	3	0	2	0	0	0	0	0	432
13:00	2	242	85	1	15	3	0	4	0	0	0	0	0	352
14:00	2	287	94	0	18	1	0	0	0	0	0	0	0	402
15:00	1	311	93	1	15	2	0	0	0	0	0	0	0	423
16:00	1	363	98	0	16	5	0	0	0	0	0	0	0	483
17:00	5	311	90	0	12	0	0	1	1	0	0	0	0	420
18:00	0	210	53	0	7	1	0	1	0	0	0	0	0	272
19:00	0	197	39	0	11	0	0	0	0	0	0	0	0	247
20:00	0	134	30	0	4	0	0	0	0	0	0	0	0	168
21:00	0	85	27	0	3	0	0	0	0	0	0	0	0	115
22:00	1	64	11	0	2	0	0	0	0	0	0	0	0	78
23:00	0	28	7	0	0	0	0	0	0	0	0	0	0	35
Total	20	4053	1218	12	206	27	0	28	4	0	1	0	0	5569
Percent	0.4%	72.8%	21.9%	0.2%	3.7%	0.5%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	08:00	11:00	07:00	11:00		07:00	08:00		09:00			11:00
Vol.	4	329	92	3	16	6		8	2		1			444
PM Peak	17:00	16:00	16:00	12:00	14:00	16:00		13:00	17:00					16:00
Vol.	5	363	98	2	18	5		4	1					483

Orleans-Harwich Road (Route 39)
east of Spences Trace
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154558 A Class
Site Code: 8200.15

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/10/1														
5	0	12	4	0	0	0	0	0	0	0	0	0	0	16
01:00	0	13	1	0	0	0	0	0	0	0	0	0	0	14
02:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
03:00	0	5	0	0	1	0	0	1	1	0	0	0	0	8
04:00	0	9	3	0	1	0	0	0	0	0	0	0	0	13
05:00	0	36	14	0	1	0	0	0	0	0	0	0	0	51
06:00	1	91	29	1	7	0	0	0	0	0	0	0	0	129
07:00	3	169	76	2	10	0	0	1	1	0	0	0	0	262
08:00	0	268	83	3	14	2	0	1	0	0	0	0	0	371
09:00	4	298	103	2	21	1	0	4	0	0	0	0	0	433
10:00	2	340	81	2	16	2	0	5	1	0	0	0	0	449
11:00	0	370	111	2	10	3	0	1	0	0	0	0	0	497
12 PM	1	376	100	1	12	2	0	0	1	0	0	0	0	493
13:00	1	342	84	0	12	5	0	3	0	0	0	0	0	447
14:00	2	354	95	0	10	2	0	2	1	0	0	0	0	466
15:00	4	354	98	1	12	2	0	2	1	0	0	0	0	474
16:00	4	385	94	0	11	0	0	0	0	0	0	0	0	494
17:00	2	324	86	0	18	1	0	3	0	0	0	0	0	434
18:00	1	237	77	0	8	0	0	1	0	0	0	0	0	324
19:00	2	195	54	0	6	0	0	0	0	0	0	0	0	257
20:00	0	161	33	0	9	2	0	0	0	0	0	0	0	205
21:00	3	134	26	1	1	0	0	0	0	0	0	0	0	165
22:00	0	84	14	0	3	0	0	0	0	0	0	0	0	101
23:00	1	50	9	0	1	0	0	0	0	0	0	0	0	61
Total	31	4610	1276	15	184	22	0	24	6	0	0	0	0	6168
Percent	0.5%	74.7%	20.7%	0.2%	3.0%	0.4%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	11:00	08:00	09:00	11:00		10:00	03:00					11:00
Vol.	4	370	111	3	21	3		5	1					497
PM Peak	15:00	16:00	12:00	12:00	17:00	13:00		13:00	12:00					16:00
Vol.	4	385	100	1	18	5		3	1					494

Orleans-Harwich Road (Route 39)
east of Spences Trace
City, State: Harwich, MA
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154558 A Class
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EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/11/1														
5	1	27	7	0	2	0	0	0	0	0	0	0	0	37
01:00	0	23	1	0	0	0	0	0	0	0	0	0	0	24
02:00	0	4	1	0	1	0	0	1	0	0	0	0	0	7
03:00	0	7	0	0	1	0	0	0	0	0	0	0	0	8
04:00	1	8	6	0	0	0	0	0	0	0	0	0	0	15
05:00	0	27	8	0	0	0	0	0	0	0	0	0	0	35
06:00	0	86	22	0	7	0	0	0	0	0	0	0	0	115
07:00	3	157	56	1	10	0	0	1	0	0	0	0	0	228
08:00	0	244	68	0	7	1	0	3	0	0	0	0	0	323
09:00	0	356	95	0	12	1	0	0	1	0	0	0	0	465
10:00	1	390	95	3	13	4	0	1	1	0	0	0	0	508
11:00	4	370	107	0	15	3	0	3	0	0	0	0	0	502
12 PM	1	340	78	1	13	1	0	1	0	0	0	0	0	435
13:00	4	296	92	0	6	2	0	2	0	0	0	0	0	402
14:00	2	340	85	1	8	1	0	0	0	0	0	0	0	437
15:00	3	297	83	1	6	0	0	4	0	0	0	0	0	394
16:00	4	299	70	0	10	3	0	0	0	0	0	0	0	386
17:00	1	276	71	0	8	0	0	1	0	0	0	0	0	357
18:00	1	257	59	0	5	1	0	1	0	0	0	0	0	324
19:00	0	203	43	0	2	0	0	1	0	0	0	0	0	249
20:00	3	126	35	0	4	1	0	0	0	0	0	0	0	169
21:00	2	95	23	0	5	0	0	0	0	0	0	0	0	125
22:00	0	77	15	0	2	1	0	0	0	0	0	0	0	95
23:00	0	54	8	0	2	1	0	0	0	0	0	0	0	65
Total	31	4359	1128	7	139	20	0	19	2	0	0	0	0	5705
Percent	0.5%	76.4%	19.8%	0.1%	2.4%	0.4%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	10:00	11:00	10:00	11:00	10:00		08:00	09:00					10:00
Vol.	4	390	107	3	15	4		3	1					508
PM Peak	13:00	12:00	13:00	12:00	12:00	16:00		15:00						14:00
Vol.	4	340	92	1	13	3		4						437

Orleans-Harwich Road (Route 39)
east of Spences Trace
City, State: Harwich, MA
Client: VHB/ K. Keen

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

154558 A Class
Site Code: 8200.15

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/09/1														
5	0	27	4	0	1	0	0	0	0	0	0	0	0	32
01:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
02:00	0	7	0	0	1	0	0	1	0	0	0	0	0	9
03:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
04:00	0	3	1	0	4	0	0	0	0	0	0	0	0	8
05:00	0	11	5	0	6	0	0	0	0	0	0	0	0	22
06:00	0	47	35	1	18	0	0	0	0	0	0	0	0	101
07:00	1	119	62	0	30	0	0	0	0	0	0	0	0	212
08:00	0	186	84	3	24	2	0	4	0	0	0	0	0	303
09:00	0	229	67	0	20	3	0	1	1	0	0	0	0	321
10:00	1	262	81	2	30	2	0	2	1	0	0	0	0	381
11:00	1	311	77	2	26	0	0	6	0	0	0	0	0	423
12 PM	1	295	99	2	23	2	0	4	0	0	0	0	0	426
13:00	1	291	96	1	25	1	0	5	0	0	0	0	0	420
14:00	1	323	96	2	30	3	0	4	0	0	0	0	0	459
15:00	4	358	126	2	34	3	0	4	0	0	0	0	0	531
16:00	2	411	131	1	37	4	0	4	1	0	0	0	0	591
17:00	3	361	99	1	31	0	0	3	0	0	0	0	0	498
18:00	2	220	63	1	18	0	0	1	1	0	0	0	0	306
19:00	2	187	41	0	12	1	0	0	0	0	0	0	0	243
20:00	0	146	31	0	11	0	0	0	0	0	0	0	0	188
21:00	0	137	28	0	6	0	0	1	0	0	0	0	0	172
22:00	0	74	21	0	6	0	0	0	0	0	0	0	0	101
23:00	1	32	12	0	1	0	0	0	0	0	0	0	0	46
Total	20	4046	1262	18	394	21	0	40	4	0	0	0	0	5805
Percent	0.3%	69.7%	21.7%	0.3%	6.8%	0.4%	0.0%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	08:00	08:00	07:00	09:00		11:00	09:00					11:00
Vol.	1	311	84	3	30	3		6	1					423
PM Peak	15:00	16:00	16:00	12:00	16:00	16:00		13:00	16:00					16:00
Vol.	4	411	131	2	37	4		5	1					591

Orleans-Harwich Road (Route 39)
east of Spences Trace
City, State: Harwich, MA
Client: VHB/ K. Keen

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154558 A Class
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WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/10/1														
5	0	14	3	0	1	0	0	0	0	0	0	0	0	18
01:00	0	18	2	0	2	0	0	0	0	0	0	0	0	22
02:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	2	3	0	2	0	0	0	1	0	0	0	0	8
05:00	0	8	14	0	6	1	0	0	0	0	0	0	0	29
06:00	0	51	27	1	19	1	0	1	0	0	0	0	0	100
07:00	0	132	57	5	19	0	0	3	1	0	0	0	0	217
08:00	0	207	68	3	22	1	0	0	0	0	0	0	0	301
09:00	0	260	84	0	27	1	0	3	0	0	0	0	0	375
10:00	1	301	78	3	29	1	0	4	0	0	0	0	0	417
11:00	0	327	90	0	22	2	0	0	2	0	0	0	0	443
12 PM	0	350	100	4	25	1	0	1	0	0	0	0	0	481
13:00	1	349	111	0	26	0	0	4	0	0	0	0	0	491
14:00	4	349	86	3	25	2	0	2	0	0	0	0	0	471
15:00	4	335	112	2	22	1	0	2	0	0	0	0	0	478
16:00	1	381	100	1	26	0	0	2	1	0	0	0	0	512
17:00	2	390	106	0	21	0	0	2	0	0	0	0	0	521
18:00	1	272	86	1	22	0	0	1	0	0	0	0	0	383
19:00	1	205	60	1	8	0	0	3	0	0	0	0	0	278
20:00	0	167	39	0	12	0	0	1	0	0	0	0	0	219
21:00	0	124	25	0	3	0	0	0	0	0	0	0	0	152
22:00	0	107	26	0	4	0	0	0	0	0	0	0	0	137
23:00	1	54	14	0	4	0	0	0	0	0	0	0	0	73
Total	16	4414	1292	24	347	11	0	29	5	0	0	0	0	6138
Percent	0.3%	71.9%	21.0%	0.4%	5.7%	0.2%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	11:00	07:00	10:00	11:00		10:00	11:00					11:00
Vol.	1	327	90	5	29	2		4	2					443
PM Peak	14:00	17:00	15:00	12:00	13:00	14:00		13:00	16:00					17:00
Vol.	4	390	112	4	26	2		4	1					521

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WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/11/1														
5	0	29	5	0	2	0	0	0	0	0	0	0	0	36
01:00	0	26	3	1	1	0	0	0	0	0	0	0	0	31
02:00	0	10	2	0	1	0	0	0	0	0	0	0	0	13
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	2	3	0	0	0	0	0	0	0	0	0	0	5
05:00	0	9	6	0	4	0	0	0	0	0	0	0	0	19
06:00	1	28	15	1	11	0	0	1	0	0	0	0	0	57
07:00	0	101	36	0	11	0	0	1	0	0	0	0	0	149
08:00	1	198	66	0	13	0	0	5	0	0	0	0	0	283
09:00	0	287	94	0	23	0	0	5	0	0	0	0	0	409
10:00	4	392	83	1	30	0	0	1	0	0	0	0	0	511
11:00	2	358	108	1	16	1	0	1	0	0	0	0	0	487
12 PM	2	339	85	0	18	0	0	3	0	0	0	0	0	447
13:00	0	309	87	0	18	0	0	1	0	0	0	0	0	415
14:00	1	279	84	0	20	1	0	1	0	0	0	0	0	386
15:00	6	307	77	0	16	0	0	0	0	0	0	0	0	406
16:00	3	285	80	1	18	1	0	0	0	0	0	0	0	388
17:00	5	272	64	0	9	0	0	1	0	0	0	0	0	351
18:00	8	277	48	0	18	0	0	1	0	0	0	0	0	352
19:00	1	192	34	0	11	0	0	0	0	0	0	0	0	238
20:00	0	146	44	0	6	0	0	0	0	0	0	0	0	196
21:00	0	126	22	0	7	0	0	0	0	0	0	0	0	155
22:00	1	109	20	0	6	0	0	0	0	0	0	0	0	136
23:00	2	80	17	0	5	0	0	0	0	0	0	0	0	104
Total	37	4163	1083	5	264	3	0	21	0	0	0	0	0	5576
Percent	0.7%	74.7%	19.4%	0.1%	4.7%	0.1%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	11:00	01:00	10:00	11:00		08:00						10:00
Vol.	4	392	108	1	30	1		5						511
PM Peak	18:00	12:00	13:00	16:00	14:00	14:00		12:00						12:00
Vol.	8	339	87	1	20	1		3						447

Orleans-Harwich Road (Route 39)
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Site Code: 8200.15

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
07/09/ 15	0	0	0	0	0	4	6	3	2	0	0	0	0	15	48	43
01:00	0	0	0	0	0	3	2	1	2	0	0	0	0	8	51	43
02:00	0	0	0	0	2	1	2	0	1	0	0	0	0	6	49	40
03:00	0	0	1	0	0	1	3	2	0	0	0	0	0	7	46	40
04:00	0	0	0	0	2	7	5	3	0	0	**1**	0	0	18	46	41
05:00	0	0	1	0	3	14	12	9	1	0	0	0	0	40	46	40
06:00	0	0	0	3	24	44	53	9	**4**	0	0	0	0	137	43	39
07:00	0	0	3	21	52	147	75	**13**	1	0	0	**1**	0	313	41	37
08:00	0	**2**	4	22	85	160	78	13	2	0	0	0	0	366	41	36
09:00	0	0	5	22	92	174	**102**	7	0	0	0	0	0	402	41	37
10:00	**1**	0	1	**27**	93	168	88	8	0	0	0	0	0	386	41	36
11:00	0	0	**9**	24	**126**	**203**	70	11	0	0	0	0	**1**	**444**	40	36
12 PM	0	0	3	**43**	143	169	67	7	0	0	0	0	0	432	39	35
13:00	**1**	**3**	4	23	104	155	56	5	0	**1**	0	0	0	352	39	35
14:00	0	0	1	31	119	184	61	6	0	0	0	0	0	402	39	36
15:00	0	3	**10**	34	93	206	68	9	0	0	0	0	0	423	39	36
16:00	0	0	4	27	**151**	**226**	73	1	**1**	0	0	0	0	**483**	39	36
17:00	0	0	0	9	111	208	84	8	0	0	0	0	0	420	40	37
18:00	0	2	5	13	39	106	**85**	**20**	1	1	0	0	0	272	42	38
19:00	0	1	0	9	47	127	51	12	0	0	0	0	0	247	41	37
20:00	0	0	0	12	35	81	30	9	1	0	0	0	0	168	41	37
21:00	0	0	0	6	26	46	32	4	1	0	0	0	0	115	42	37
22:00	0	1	1	5	13	31	21	6	0	0	0	0	0	78	42	37
23:00	0	0	0	2	4	16	10	1	1	1	0	0	0	35	42	39
Total	2	12	52	333	1364	2481	1134	167	18	3	1	1	1	5569		
%	0.0%	0.2%	0.9%	6.0%	24.5%	44.6%	20.4%	3.0%	0.3%	0.1%	0.0%	0.0%	0.0%			
AM Peak	10:00	08:00	11:00	10:00	11:00	11:00	09:00	07:00	06:00		04:00	07:00	11:00	11:00		
Vol.	1	2	9	27	126	203	102	13	4		1	1	1	444		
PM Peak	13:00	13:00	15:00	12:00	16:00	16:00	18:00	18:00	16:00	13:00				16:00		
Vol.	1	3	10	43	151	226	85	20	1	1				483		

Stats

15th Percentile :	30 MPH
50th Percentile :	36 MPH
85th Percentile :	41 MPH
95th Percentile :	43 MPH
Mean Speed(Average) :	36 MPH
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	3845
Percent in Pace :	69.1%
Number of Vehicles > 35 MPH :	3310
Percent of Vehicles > 35 MPH :	59.4%

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Orleans-Harwich Road (Route 39)
east of Spence Trace
City, State: Harwich, MA
Client: VHB/ K. Keen

154558 A Speed
Site Code: 8200.15

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
07/10/ 15	0	0	0	0	4	4	5	2	**1**	0	0	0	0	16	45	40
01:00	0	0	0	0	1	6	4	2	1	0	0	0	0	14	46	41
02:00	0	0	0	0	0	1	2	1	0	0	0	0	0	4	46	42
03:00	0	0	0	0	1	3	2	2	0	0	0	0	0	8	46	40
04:00	0	0	1	2	1	5	2	1	0	**1**	0	0	0	13	44	37
05:00	0	0	1	0	6	12	21	9	1	0	**1**	0	0	51	45	41
06:00	0	0	0	4	19	57	43	5	0	1	0	0	0	129	42	38
07:00	0	0	3	21	48	105	75	10	0	0	0	0	0	262	42	37
08:00	0	0	3	33	95	150	**79**	9	1	1	0	0	0	371	41	36
09:00	0	0	2	26	111	206	75	11	1	0	1	0	0	433	40	36
10:00	**2**	**1**	**15**	31	122	202	63	**13**	0	0	0	0	0	449	39	35
11:00	0	1	6	**47**	**152**	**225**	62	4	0	0	0	0	0	**497**	38	35
12 PM	1	1	**13**	**48**	**169**	199	59	3	0	0	0	0	0	493	38	34
13:00	0	2	12	41	107	217	65	3	0	0	0	0	0	447	39	35
14:00	**2**	1	4	32	128	220	67	11	1	0	0	0	0	466	39	36
15:00	0	**5**	4	24	99	**236**	95	9	**2**	0	0	0	0	474	40	36
16:00	0	0	7	22	111	223	**115**	15	1	0	0	0	0	**494**	41	37
17:00	0	2	5	23	87	210	87	**19**	1	0	0	0	0	434	41	37
18:00	0	1	4	14	47	142	101	15	0	0	0	0	0	324	42	38
19:00	0	0	0	10	52	114	70	11	0	0	0	0	0	257	42	37
20:00	0	0	3	10	54	89	42	5	0	**2**	0	0	0	205	41	36
21:00	0	0	1	8	32	82	38	4	0	0	0	0	0	165	41	37
22:00	0	0	0	6	13	52	21	7	1	1	0	0	0	101	42	38
23:00	0	0	0	1	9	21	20	9	1	0	0	0	0	61	44	39
Total	5	14	84	403	1468	2781	1213	180	12	6	2	0	0	6168		
%	0.1%	0.2%	1.4%	6.5%	23.8%	45.1%	19.7%	2.9%	0.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	10:00	11:00	11:00	11:00	08:00	10:00	00:00	04:00	05:00			11:00		
Vol.	2	1	15	47	152	225	79	13	1	1	1			497		
PM Peak	14:00	15:00	12:00	12:00	12:00	15:00	16:00	17:00	15:00	20:00				16:00		
Vol.	2	5	13	48	169	236	115	19	2	2				494		

Stats

15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	41 MPH
95th Percentile :	43 MPH
Mean Speed(Average) :	36 MPH
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	4249
Percent in Pace :	68.9%
Number of Vehicles > 35 MPH :	3638
Percent of Vehicles > 35 MPH :	59.0%

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Site Code: 8200.15

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
07/11/ 15	0	0	0	0	8	13	13	2	0	**1**	0	0	0	37	43	39
01:00	0	0	0	0	1	11	9	2	1	0	0	0	0	24	43	40
02:00	0	0	0	0	1	1	4	1	0	0	0	0	0	7	43	41
03:00	0	0	0	0	2	3	1	2	0	0	0	0	0	8	46	39
04:00	0	0	0	0	3	2	5	3	1	1	0	0	0	15	48	42
05:00	0	0	1	0	4	6	15	6	1	0	0	0	**2**	35	45	40
06:00	0	1	0	2	8	27	49	25	2	1	0	0	0	115	46	41
07:00	0	0	2	6	22	81	88	24	**5**	0	0	0	0	228	43	39
08:00	0	0	0	4	45	121	**124**	**26**	2	0	**1**	0	0	323	43	39
09:00	0	**4**	4	14	104	**217**	101	19	2	0	0	0	0	465	41	37
10:00	0	2	5	34	**157**	212	89	8	1	0	0	0	0	**508**	40	36
11:00	**1**	1	**7**	**44**	155	180	101	12	1	0	0	0	0	502	40	36
12 PM	0	0	9	18	108	**202**	89	8	0	0	0	**1**	0	435	40	36
13:00	0	**4**	**11**	26	74	170	104	13	0	0	0	0	0	402	41	36
14:00	0	1	3	21	**112**	185	**109**	5	1	0	0	0	0	**437**	41	36
15:00	0	1	1	16	77	174	103	**22**	0	0	0	0	0	394	42	37
16:00	0	0	3	8	55	199	107	13	1	0	0	0	0	386	41	38
17:00	0	0	3	**34**	62	142	102	12	1	**1**	0	0	0	357	42	37
18:00	0	0	1	19	57	153	86	7	1	0	0	0	0	324	41	37
19:00	0	0	1	12	39	129	61	7	0	0	0	0	0	249	41	37
20:00	0	0	0	10	49	67	38	5	0	0	0	0	0	169	41	36
21:00	0	0	2	13	26	55	18	8	2	1	0	0	0	125	41	36
22:00	0	0	1	7	15	44	23	5	0	0	0	0	0	95	41	37
23:00	0	0	0	2	6	24	20	10	**3**	0	0	0	0	65	45	40
Total	1	14	54	290	1190	2418	1459	245	25	5	1	1	2	5705		
%	0.0%	0.2%	0.9%	5.1%	20.9%	42.4%	25.6%	4.3%	0.4%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	09:00	11:00	11:00	10:00	09:00	08:00	08:00	07:00	00:00	08:00		05:00	10:00		
Vol.	1	4	7	44	157	217	124	26	5	1	1		2	508		
PM Peak		13:00	13:00	17:00	14:00	12:00	14:00	15:00	23:00	17:00		12:00		14:00		
Vol.		4	11	34	112	202	109	22	3	1		1		437		

Stats

15th Percentile :	31 MPH
50th Percentile :	36 MPH
85th Percentile :	42 MPH
95th Percentile :	43 MPH
Mean Speed(Average) :	37 MPH
10 MPH Pace Speed :	35-44 MPH
Number in Pace :	3877
Percent in Pace :	68.0%
Number of Vehicles > 35 MPH :	3672
Percent of Vehicles > 35 MPH :	64.4%

Orleans-Harwich Road (Route 39)
east of Spence Trace
City, State: Harwich, MA
Client: VHB/ K. Keen

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

154558 A Speed
Site Code: 8200.15

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
07/09/ 15	0	0	0	1	5	4	9	9	4	0	0	0	0	32	48	42
01:00	0	0	0	0	1	4	0	1	0	**1**	0	0	0	7	48	41
02:00	0	0	0	1	0	1	4	3	0	0	0	0	0	9	46	41
03:00	0	0	0	0	0	1	4	0	0	0	0	0	0	5	43	41
04:00	0	0	0	0	0	1	3	2	2	0	0	0	0	8	51	45
05:00	0	0	1	0	0	5	8	4	3	1	0	0	0	22	50	43
06:00	0	0	0	4	4	15	40	29	**9**	0	0	0	0	101	47	43
07:00	0	0	0	8	13	63	89	**36**	3	0	0	0	0	212	45	40
08:00	0	1	**7**	15	32	122	90	30	6	0	0	0	0	303	43	38
09:00	0	0	2	**25**	73	119	76	23	2	1	0	0	0	321	42	37
10:00	0	**2**	2	11	62	186	93	20	5	0	0	0	0	381	42	38
11:00	0	0	4	16	**79**	**188**	**114**	22	0	0	0	0	0	**423**	42	37
12 PM	0	0	7	32	92	174	100	20	1	0	0	0	0	426	41	37
13:00	0	1	**9**	23	72	180	106	25	4	0	0	0	0	420	42	37
14:00	0	1	2	12	98	227	93	23	3	0	0	0	0	459	41	37
15:00	0	0	4	**41**	96	232	119	36	1	**2**	0	0	0	531	42	37
16:00	0	**3**	3	36	**129**	**258**	119	**37**	6	0	0	0	0	**591**	42	37
17:00	0	0	4	30	80	209	**145**	26	3	1	0	0	0	498	42	38
18:00	0	0	8	21	39	100	104	24	**10**	0	0	0	0	306	43	38
19:00	0	0	3	15	27	87	91	18	2	0	0	0	0	243	43	38
20:00	0	0	1	9	24	75	59	17	2	1	0	0	0	188	43	39
21:00	0	0	2	8	26	62	60	13	1	0	0	0	0	172	43	38
22:00	0	0	1	5	13	31	39	8	4	0	0	0	0	101	43	39
23:00	0	0	0	2	6	13	10	11	4	0	0	0	0	46	47	41
Total	0	8	60	315	971	2357	1575	437	75	7	0	0	0	5805		
%	0.0%	0.1%	1.0%	5.4%	16.7%	40.6%	27.1%	7.5%	1.3%	0.1%	0.0%	0.0%	0.0%			
AM Peak		10:00	08:00	09:00	11:00	11:00	11:00	07:00	06:00	01:00				11:00		
Vol.		2	7	25	79	188	114	36	9	1				423		
PM Peak		16:00	13:00	15:00	16:00	16:00	17:00	16:00	18:00	15:00				16:00		
Vol.		3	9	41	129	258	145	37	10	2				591		

Stats

15th Percentile :	31 MPH
50th Percentile :	37 MPH
85th Percentile :	42 MPH
95th Percentile :	46 MPH
Mean Speed(Average) :	38 MPH
10 MPH Pace Speed :	35-44 MPH
Number in Pace :	3932
Percent in Pace :	67.7%
Number of Vehicles > 35 MPH :	3980
Percent of Vehicles > 35 MPH :	68.6%

Orleans-Harwich Road (Route 39)
east of Spence Trace
City, State: Harwich, MA
Client: VHB/ K. Keen

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

154558 A Speed
Site Code: 8200.15

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
07/10/ 15	0	0	0	1	3	4	5	4	1	0	0	0	0	18	46	40
01:00	0	0	0	1	4	2	11	4	0	0	0	0	0	22	44	40
02:00	0	0	0	0	0	0	4	4	0	0	0	0	0	8	47	45
03:00	0	0	0	1	1	2	0	0	0	0	0	0	0	4	37	33
04:00	0	1	0	0	0	2	3	1	0	**1**	0	0	0	8	47	40
05:00	0	0	1	0	0	8	14	4	2	0	0	0	0	29	46	41
06:00	0	0	3	4	13	35	26	18	1	0	0	0	0	100	45	39
07:00	0	1	2	9	28	93	60	21	2	1	0	0	0	217	43	38
08:00	0	1	4	13	40	120	**92**	25	**5**	1	0	0	0	301	43	38
09:00	0	0	2	18	63	186	84	20	2	0	0	0	0	375	41	37
10:00	0	0	5	14	**88**	200	84	23	3	0	0	0	0	417	41	37
11:00	**4**	**7**	**6**	**25**	81	**218**	73	**27**	2	0	0	0	0	**443**	41	36
12 PM	0	0	**6**	30	**130**	195	97	20	2	1	0	0	0	481	41	36
13:00	0	0	2	34	121	200	111	21	2	0	0	0	0	491	41	37
14:00	0	0	3	22	104	**228**	97	16	1	0	0	0	0	471	41	37
15:00	0	**1**	3	17	79	216	123	39	0	0	0	0	0	478	42	38
16:00	0	0	4	**35**	84	221	130	36	2	0	0	0	0	512	42	37
17:00	0	0	6	30	88	213	**139**	**40**	**5**	0	0	0	0	**521**	42	38
18:00	0	0	2	35	59	159	112	14	2	0	0	0	0	383	42	37
19:00	0	0	2	16	26	112	86	32	4	0	0	0	0	278	43	39
20:00	0	0	1	9	32	83	73	20	0	0	0	**1**	0	219	43	39
21:00	0	0	0	9	22	67	41	11	1	1	0	0	0	152	42	38
22:00	0	0	1	5	18	51	49	11	2	0	0	0	0	137	43	39
23:00	0	0	1	2	6	18	33	10	1	**2**	0	0	0	73	45	40
Total	4	11	54	330	1090	2633	1547	421	40	7	0	1	0	6138		
%	0.1%	0.2%	0.9%	5.4%	17.8%	42.9%	25.2%	6.9%	0.7%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	10:00	11:00	08:00	11:00	08:00	04:00				11:00		
Vol.	4	7	6	25	88	218	92	27	5	1				443		
PM Peak		15:00	12:00	16:00	12:00	14:00	17:00	17:00	17:00	23:00		20:00		17:00		
Vol.		1	6	35	130	228	139	40	5	2		1		521		

Stats

15th Percentile :	31 MPH
50th Percentile :	37 MPH
85th Percentile :	42 MPH
95th Percentile :	45 MPH
Mean Speed(Average) :	37 MPH
10 MPH Pace Speed :	35-44 MPH
Number in Pace :	4180
Percent in Pace :	68.1%
Number of Vehicles > 35 MPH :	4122
Percent of Vehicles > 35 MPH :	67.2%

Orleans-Harwich Road (Route 39)
east of Spence Trace
City, State: Harwich, MA
Client: VHB/ K. Keen

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

154558 A Speed
Site Code: 8200.15

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
07/11/ 15	0	0	1	0	3	14	12	2	3	1	0	0	0	36	45	40
01:00	0	**1**	0	1	2	5	12	9	1	0	0	0	0	31	46	41
02:00	0	0	0	0	1	6	5	0	1	0	0	0	0	13	43	40
03:00	0	0	0	0	0	0	2	0	0	0	0	0	0	2	43	42
04:00	0	0	0	0	0	0	2	3	0	0	0	0	0	5	47	45
05:00	0	0	1	0	2	4	8	3	1	0	0	0	0	19	45	40
06:00	**1**	0	1	2	2	6	26	12	5	**2**	0	0	0	57	48	42
07:00	0	0	1	5	15	48	53	20	7	0	0	0	0	149	45	40
08:00	0	0	1	11	36	98	92	**37**	**8**	0	0	0	0	283	44	39
09:00	0	0	0	14	75	170	121	25	4	0	0	0	0	409	42	38
10:00	0	1	**5**	**22**	**125**	**201**	129	24	3	1	0	0	0	**511**	42	37
11:00	0	0	3	15	86	196	**149**	32	6	0	0	0	0	487	42	38
12 PM	0	1	3	20	48	**208**	133	31	3	0	0	0	0	**447**	42	38
13:00	0	0	4	22	**77**	172	108	31	1	0	0	0	0	415	42	37
14:00	0	**3**	1	14	64	166	103	33	2	0	0	0	0	386	42	38
15:00	0	0	1	13	47	155	**139**	42	6	**3**	0	0	0	406	43	39
16:00	0	0	2	9	65	141	116	**44**	**10**	1	0	0	0	388	43	39
17:00	0	0	**6**	22	33	133	126	28	2	1	0	0	0	351	43	38
18:00	0	0	5	**26**	51	130	109	26	4	1	0	0	0	352	43	38
19:00	0	0	2	19	34	84	68	26	5	0	0	0	0	238	43	38
20:00	0	0	2	14	32	79	50	16	3	0	0	0	0	196	42	38
21:00	0	0	0	11	20	63	43	16	1	1	0	0	0	155	43	38
22:00	0	0	0	5	20	44	52	12	2	1	0	0	0	136	43	39
23:00	0	0	1	4	13	32	29	22	3	0	0	0	0	104	46	40
Total	1	6	40	249	851	2155	1687	494	81	12	0	0	0	5576		
%	0.0%	0.1%	0.7%	4.5%	15.3%	38.6%	30.3%	8.9%	1.5%	0.2%	0.0%	0.0%	0.0%			
AM Peak	06:00	01:00	10:00	10:00	10:00	10:00	11:00	08:00	08:00	06:00				10:00		
Vol.	1	1	5	22	125	201	149	37	8	2				511		
PM Peak		14:00	17:00	18:00	13:00	12:00	15:00	16:00	16:00	15:00				12:00		
Vol.		3	6	26	77	208	139	44	10	3				447		

Stats

15th Percentile :	32 MPH
50th Percentile :	37 MPH
85th Percentile :	43 MPH
95th Percentile :	47 MPH
Mean Speed(Average) :	38 MPH
10 MPH Pace Speed :	35-44 MPH
Number in Pace :	3842
Percent in Pace :	68.9%
Number of Vehicles > 35 MPH :	3998
Percent of Vehicles > 35 MPH :	71.7%

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Brewster-Chatham Road (Route 137)
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 A
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Brewster-Chatham Road (Route 137) From North				Orleans-Harwich Road (Route 39) From East				Brewster-Chatham Road (Route 137) From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	57	127	33	0	31	61	9	0	23	120	33	0	17	76	54	0	641
04:15 PM	61	111	38	0	34	77	13	0	17	106	25	0	17	58	58	0	615
04:30 PM	58	113	42	0	31	70	18	0	15	109	26	0	24	55	52	0	613
04:45 PM	67	98	35	0	39	71	15	0	16	113	28	0	19	64	36	0	601
Total	243	449	148	0	135	279	55	0	71	448	112	0	77	253	200	0	2470
05:00 PM	45	112	40	0	24	67	25	0	16	114	29	0	19	73	39	0	603
05:15 PM	56	88	31	0	28	63	12	0	13	139	17	0	28	64	36	0	575
05:30 PM	38	90	16	0	31	53	11	0	12	112	25	0	20	58	33	0	499
05:45 PM	43	94	27	0	23	58	12	0	8	92	23	0	19	43	31	0	473
Total	182	384	114	0	106	241	60	0	49	457	94	0	86	238	139	0	2150
Grand Total	425	833	262	0	241	520	115	0	120	905	206	0	163	491	339	0	4620
Apprch %	28	54.8	17.2	0	27.5	59.4	13.1	0	9.7	73.5	16.7	0	16.4	49.4	34.1	0	
Total %	9.2	18	5.7	0	5.2	11.3	2.5	0	2.6	19.6	4.5	0	3.5	10.6	7.3	0	
Cars	420	816	262	0	232	510	115	0	119	886	204	0	158	485	334	0	4541
% Cars	98.8	98	100	0	96.3	98.1	100	0	99.2	97.9	99	0	96.9	98.8	98.5	0	98.3
Heavy Vehicles	5	17	0	0	9	10	0	0	1	19	2	0	5	6	5	0	79
% Heavy Vehicles	1.2	2	0	0	3.7	1.9	0	0	0.8	2.1	1	0	3.1	1.2	1.5	0	1.7

	Brewster-Chatham Road (Route 137) From North					Orleans-Harwich Road (Route 39) From East					Brewster-Chatham Road (Route 137) From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	57	**127**	33	0	**217**	31	61	9	0	101	**23**	**120**	**33**	0	**176**	17	**76**	54	0	**147**	**641**
04:15 PM	61	111	38	0	210	34	**77**	13	0	124	17	106	25	0	148	17	58	**58**	0	133	615
04:30 PM	58	113	**42**	0	213	31	70	**18**	0	119	15	109	26	0	150	**24**	55	52	0	131	613
04:45 PM	**67**	98	35	0	200	**39**	71	15	0	**125**	16	113	28	0	157	19	64	36	0	119	601
Total Volume	243	449	148	0	840	135	279	55	0	469	71	448	112	0	631	77	253	200	0	530	2470
% App. Total	28.9	53.5	17.6	0		28.8	59.5	11.7	0		11.3	71	17.7	0		14.5	47.7	37.7	0		
PHF	.907	.884	.881	.000	.968	.865	.906	.764	.000	.938	.772	.933	.848	.000	.896	.802	.832	.862	.000	.901	.963
Cars	239	441	148	0	828	129	273	55	0	457	71	439	111	0	621	74	247	197	0	518	2424
% Cars	98.4	98.2	100	0	98.6	95.6	97.8	100	0	97.4	100	98.0	99.1	0	98.4	96.1	97.6	98.5	0	97.7	98.1
Heavy Vehicles	4	8	0	0	12	6	6	0	0	12	0	9	1	0	10	3	6	3	0	12	46
% Heavy Vehicles	1.6	1.8	0	0	1.4	4.4	2.2	0	0	2.6	0	2.0	0.9	0	1.6	3.9	2.4	1.5	0	2.3	1.9

PRECISION
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N/S: Brewster-Chatham Road (Route 137)
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 A
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

Groups Printed- Cars

	Brewster-Chatham Road (Route 137) From North				Orleans-Harwich Road (Route 39) From East				Brewster-Chatham Road (Route 137) From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	56	124	33	0	31	58	9	0	23	120	32	0	16	74	53	0	629
04:15 PM	61	109	38	0	32	76	13	0	17	103	25	0	17	56	57	0	604
04:30 PM	56	111	42	0	30	69	18	0	15	105	26	0	23	53	51	0	599
04:45 PM	66	97	35	0	36	70	15	0	16	111	28	0	18	64	36	0	592
Total	239	441	148	0	129	273	55	0	71	439	111	0	74	247	197	0	2424
05:00 PM	45	109	40	0	24	64	25	0	15	114	29	0	19	73	38	0	595
05:15 PM	55	86	31	0	27	63	12	0	13	135	17	0	27	64	36	0	566
05:30 PM	38	89	16	0	31	53	11	0	12	111	24	0	19	58	32	0	494
05:45 PM	43	91	27	0	21	57	12	0	8	87	23	0	19	43	31	0	462
Total	181	375	114	0	103	237	60	0	48	447	93	0	84	238	137	0	2117
Grand Total	420	816	262	0	232	510	115	0	119	886	204	0	158	485	334	0	4541
Apprch %	28	54.5	17.5	0	27.1	59.5	13.4	0	9.8	73.3	16.9	0	16.2	49.6	34.2	0	
Total %	9.2	18	5.8	0	5.1	11.2	2.5	0	2.6	19.5	4.5	0	3.5	10.7	7.4	0	

	Brewster-Chatham Road (Route 137) From North					Orleans-Harwich Road (Route 39) From East					Brewster-Chatham Road (Route 137) From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	56	**124**	33	0	**213**	31	58	9	0	98	**23**	**120**	**32**	0	**175**	16	**74**	53	0	**143**	**629**
04:15 PM	61	109	38	0	208	32	**76**	13	0	**121**	17	103	25	0	145	17	56	**57**	0	130	604
04:30 PM	56	111	**42**	0	209	30	69	**18**	0	117	15	105	26	0	146	**23**	53	51	0	127	599
04:45 PM	**66**	97	35	0	198	**36**	70	15	0	121	16	111	28	0	155	18	64	36	0	118	592
Total Volume	239	441	148	0	828	129	273	55	0	457	71	439	111	0	621	74	247	197	0	518	2424
% App. Total	28.9	53.3	17.9	0		28.2	59.7	12	0		11.4	70.7	17.9	0		14.3	47.7	38	0		
PHF	.905	.889	.881	.000	.972	.896	.898	.764	.000	.944	.772	.915	.867	.000	.887	.804	.834	.864	.000	.906	.963

PRECISION
D A T A
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Email: datarequests@pdillc.com

N/S: Brewster-Chatham Road (Route 137)
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 A
Site Code : 8200.15
Start Date : 7/9/2015

Groups Printed- Heavy Vehicles

	Brewster-Chatham Road (Route 137) From North				Orleans-Harwich Road (Route 39) From East				Brewster-Chatham Road (Route 137) From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	1	3	0	0	0	3	0	0	0	0	1	0	1	2	1	0	12
04:15 PM	0	2	0	0	2	1	0	0	0	3	0	0	0	2	1	0	11
04:30 PM	2	2	0	0	1	1	0	0	0	4	0	0	1	2	1	0	14
04:45 PM	1	1	0	0	3	1	0	0	0	2	0	0	1	0	0	0	9
Total	4	8	0	0	6	6	0	0	0	9	1	0	3	6	3	0	46
05:00 PM	0	3	0	0	0	3	0	0	1	0	0	0	0	0	1	0	8
05:15 PM	1	2	0	0	1	0	0	0	0	4	0	0	1	0	0	0	9
05:30 PM	0	1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	5
05:45 PM	0	3	0	0	2	1	0	0	0	5	0	0	0	0	0	0	11
Total	1	9	0	0	3	4	0	0	1	10	1	0	2	0	2	0	33
Grand Total	5	17	0	0	9	10	0	0	1	19	2	0	5	6	5	0	79
Apprch %	22.7	77.3	0	0	47.4	52.6	0	0	4.5	86.4	9.1	0	31.2	37.5	31.2	0	
Total %	6.3	21.5	0	0	11.4	12.7	0	0	1.3	24.1	2.5	0	6.3	7.6	6.3	0	

	Brewster-Chatham Road (Route 137) From North					Orleans-Harwich Road (Route 39) From East					Brewster-Chatham Road (Route 137) From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	1	**3**	0	0	**4**	0	**3**	0	0	3	0	0	**1**	0	1	**1**	**2**	**1**	0	**4**	12
04:15 PM	0	2	0	0	2	2	1	0	0	3	0	3	0	0	3	0	2	1	0	3	11
04:30 PM	**2**	2	0	0	4	1	1	0	0	2	0	**4**	0	0	**4**	1	2	1	0	4	**14**
04:45 PM	1	1	0	0	2	**3**	1	0	0	**4**	0	2	0	0	2	1	0	0	0	1	9
Total Volume	4	8	0	0	12	6	6	0	0	12	0	9	1	0	10	3	6	3	0	12	46
% App. Total	33.3	66.7	0	0		50	50	0	0		0	90	10	0		25	50	25	0		
PHF	.500	.667	.000	.000	.750	.500	.500	.000	.000	.750	.000	.563	.250	.000	.625	.750	.750	.750	.000	.750	.821

PRECISION
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N/S: Brewster-Chatham Road (Route 137)
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 A
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

Groups Printed- Peds and Bicycles

	Brewster-Chatham Road (Route 137) From North					Orleans-Harwich Road (Route 39) From East					Brewster-Chatham Road (Route 137) From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	3
Grand Total	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	1	5
Apprch %	0	0	0	0	0	0	0	0	100	0	0	50	0	0	50	0	50	0	0	50	
Total %	0	0	0	0	0	0	0	0	20	0	0	20	0	0	20	0	20	0	0	20	

	Brewster-Chatham Road (Route 137) From North						Orleans-Harwich Road (Route 39) From East						Brewster-Chatham Road (Route 137) From South						Orleans-Harwich Road (Route 39) From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:45 PM																									
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	**1**	**1**	**2**
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	1	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	1	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	1	0	0	1	2	4
% App. Total	0	0	0	0	0		0	0	0	0	0		0	50	0	0	50		0	50	0	0	50		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.500	.000	.250	.000	.000	.250	.500	.500

PRECISION
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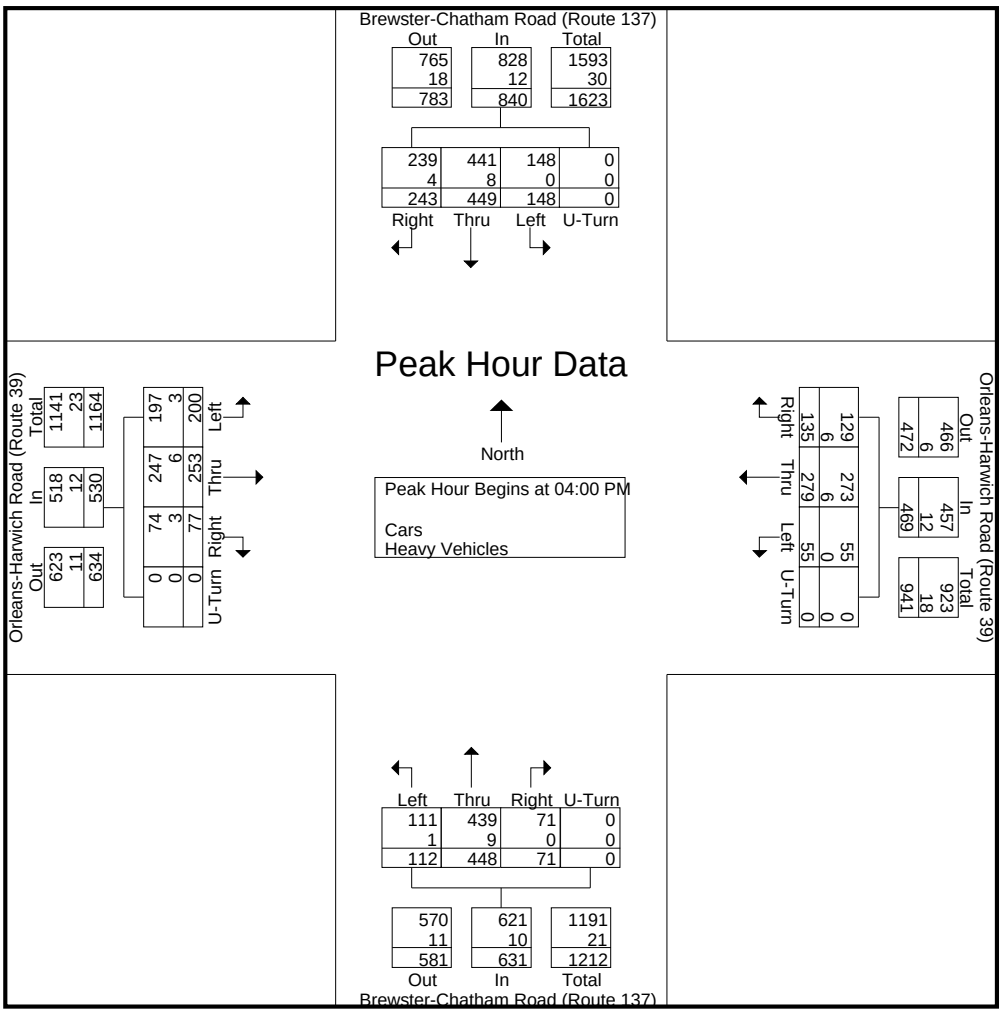
N/S: Brewster-Chatham Road (Route 137)
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 A
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

	Brewster-Chatham Road (Route 137) From North					Orleans-Harwich Road (Route 39) From East					Brewster-Chatham Road (Route 137) From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	57	**127**	33	0	**217**	31	61	9	0	101	**23**	**120**	**33**	0	**176**	17	**76**	54	0	**147**	**641**
04:15 PM	61	111	38	0	210	34	**77**	13	0	124	17	106	25	0	148	17	58	**58**	0	133	615
04:30 PM	58	113	**42**	0	213	31	70	**18**	0	119	15	109	26	0	150	**24**	55	52	0	131	613
04:45 PM	**67**	98	35	0	200	**39**	71	15	0	**125**	16	113	28	0	157	19	64	36	0	119	601
Total Volume	243	449	148	0	840	135	279	55	0	469	71	448	112	0	631	77	253	200	0	530	2470
% App. Total	28.9	53.5	17.6	0		28.8	59.5	11.7	0		11.3	71	17.7	0		14.5	47.7	37.7	0		
PHF	.907	.884	.881	.000	.968	.865	.906	.764	.000	.938	.772	.933	.848	.000	.896	.802	.832	.862	.000	.901	.963
Cars	239	441	148	0	828	129	273	55	0	457	71	439	111	0	621	74	247	197	0	518	2424
% Cars	98.4	98.2	100	0	98.6	95.6	97.8	100	0	97.4	100	98.0	99.1	0	98.4	96.1	97.6	98.5	0	97.7	98.1
Heavy Vehicles	4	8	0	0	12	6	6	0	0	12	0	9	1	0	10	3	6	3	0	12	46
% Heavy Vehicles	1.6	1.8	0	0	1.4	4.4	2.2	0	0	2.6	0	2.0	0.9	0	1.6	3.9	2.4	1.5	0	2.3	1.9



PRECISION
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N/S: Brewster-Chatham Road (Route 137)
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 AA
Site Code : 8200.15
Start Date : 7/11/2015

Groups Printed- Cars - Heavy Vehicles

	Brewster-Chatham Road (Route 137) From North				Orleans-Harwich Road (Route 39) From East				Brewster-Chatham Road (Route 137) From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
11:00 AM	49	112	28	0	31	56	13	0	16	106	25	0	17	88	43	0	584
11:15 AM	45	93	33	0	33	53	8	0	17	88	33	0	22	69	40	0	534
11:30 AM	44	115	32	0	31	74	12	0	20	87	20	0	23	67	37	0	562
11:45 AM	40	71	31	0	34	66	13	0	14	91	25	0	22	47	45	0	499
Total	178	391	124	0	129	249	46	0	67	372	103	0	84	271	165	0	2179
12:00 PM	37	110	37	0	30	62	8	0	5	120	31	0	21	41	34	0	536
12:15 PM	36	91	31	0	34	59	7	0	14	98	24	0	20	63	37	0	514
12:30 PM	39	92	33	0	25	47	10	0	9	90	23	0	21	62	49	0	500
12:45 PM	45	109	26	0	32	31	10	0	12	96	27	0	17	60	39	0	504
Total	157	402	127	0	121	199	35	0	40	404	105	0	79	226	159	0	2054
Grand Total	335	793	251	0	250	448	81	0	107	776	208	0	163	497	324	0	4233
Apprch %	24.3	57.5	18.2	0	32.1	57.5	10.4	0	9.8	71.1	19.1	0	16.6	50.5	32.9	0	
Total %	7.9	18.7	5.9	0	5.9	10.6	1.9	0	2.5	18.3	4.9	0	3.9	11.7	7.7	0	
Cars	326	783	249	0	239	437	80	0	104	760	208	0	158	497	318	0	4159
% Cars	97.3	98.7	99.2	0	95.6	97.5	98.8	0	97.2	97.9	100	0	96.9	100	98.1	0	98.3
Heavy Vehicles	9	10	2	0	11	11	1	0	3	16	0	0	5	0	6	0	74
% Heavy Vehicles	2.7	1.3	0.8	0	4.4	2.5	1.2	0	2.8	2.1	0	0	3.1	0	1.9	0	1.7

	Brewster-Chatham Road (Route 137) From North					Orleans-Harwich Road (Route 39) From East					Brewster-Chatham Road (Route 137) From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	**49**	112	28	0	189	31	56	**13**	0	100	16	**106**	25	0	**147**	17	**88**	43	0	**148**	**584**
11:15 AM	45	93	**33**	0	171	33	53	8	0	94	17	88	**33**	0	138	22	69	40	0	131	534
11:30 AM	44	**115**	32	0	**191**	31	**74**	12	0	**117**	**20**	87	20	0	127	**23**	67	37	0	127	562
11:45 AM	40	71	31	0	142	**34**	66	13	0	113	14	91	25	0	130	22	47	**45**	0	114	499
Total Volume	178	391	124	0	693	129	249	46	0	424	67	372	103	0	542	84	271	165	0	520	2179
% App. Total	25.7	56.4	17.9	0		30.4	58.7	10.8	0		12.4	68.6	19	0		16.2	52.1	31.7	0		
PHF	.908	.850	.939	.000	.907	.949	.841	.885	.000	.906	.838	.877	.780	.000	.922	.913	.770	.917	.000	.878	.933
Cars	170	383	122	0	675	122	241	45	0	408	64	363	103	0	530	81	271	161	0	513	2126
% Cars	95.5	98.0	98.4	0	97.4	94.6	96.8	97.8	0	96.2	95.5	97.6	100	0	97.8	96.4	100	97.6	0	98.7	97.6
Heavy Vehicles	8	8	2	0	18	7	8	1	0	16	3	9	0	0	12	3	0	4	0	7	53
% Heavy Vehicles	4.5	2.0	1.6	0	2.6	5.4	3.2	2.2	0	3.8	4.5	2.4	0	0	2.2	3.6	0	2.4	0	1.3	2.4

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N/S: Brewster-Chatham Road (Route 137)
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 AA
Site Code : 8200.15
Start Date : 7/11/2015
Page No : 1

Groups Printed- Cars

	Brewster-Chatham Road (Route 137) From North				Orleans-Harwich Road (Route 39) From East				Brewster-Chatham Road (Route 137) From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
11:00 AM	46	111	28	0	29	55	13	0	16	104	25	0	17	88	42	0	574
11:15 AM	45	90	32	0	31	53	8	0	16	86	33	0	22	69	38	0	523
11:30 AM	41	112	32	0	29	71	12	0	18	85	20	0	22	67	37	0	546
11:45 AM	38	70	30	0	33	62	12	0	14	88	25	0	20	47	44	0	483
Total	170	383	122	0	122	241	45	0	64	363	103	0	81	271	161	0	2126
12:00 PM	37	109	37	0	28	62	8	0	5	118	31	0	21	41	32	0	529
12:15 PM	36	91	31	0	33	59	7	0	14	96	24	0	19	63	37	0	510
12:30 PM	38	92	33	0	25	45	10	0	9	89	23	0	21	62	49	0	496
12:45 PM	45	108	26	0	31	30	10	0	12	94	27	0	16	60	39	0	498
Total	156	400	127	0	117	196	35	0	40	397	105	0	77	226	157	0	2033
Grand Total	326	783	249	0	239	437	80	0	104	760	208	0	158	497	318	0	4159
Apprch %	24	57.7	18.3	0	31.6	57.8	10.6	0	9.7	70.9	19.4	0	16.2	51.1	32.7	0	
Total %	7.8	18.8	6	0	5.7	10.5	1.9	0	2.5	18.3	5	0	3.8	11.9	7.6	0	

	Brewster-Chatham Road (Route 137) From North					Orleans-Harwich Road (Route 39) From East					Brewster-Chatham Road (Route 137) From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	**46**	111	28	0	**185**	29	55	**13**	0	97	16	**104**	25	0	**145**	17	**88**	42	0	**147**	**574**
11:15 AM	45	90	**32**	0	167	31	53	8	0	92	16	86	**33**	0	135	**22**	69	38	0	129	523
11:30 AM	41	**112**	32	0	185	29	**71**	12	0	**112**	**18**	85	20	0	123	22	67	37	0	126	546
11:45 AM	38	70	30	0	138	**33**	62	12	0	107	14	88	25	0	127	20	47	**44**	0	111	483
Total Volume	170	383	122	0	675	122	241	45	0	408	64	363	103	0	530	81	271	161	0	513	2126
% App. Total	25.2	56.7	18.1	0		29.9	59.1	11	0		12.1	68.5	19.4	0		15.8	52.8	31.4	0		
PHF	.924	.855	.953	.000	.912	.924	.849	.865	.000	.911	.889	.873	.780	.000	.914	.920	.770	.915	.000	.872	.926

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City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 AA
Site Code : 8200.15
Start Date : 7/11/2015

Groups Printed- Heavy Vehicles

	Brewster-Chatham Road (Route 137) From North				Orleans-Harwich Road (Route 39) From East				Brewster-Chatham Road (Route 137) From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
11:00 AM	3	1	0	0	2	1	0	0	0	2	0	0	0	0	1	0	10
11:15 AM	0	3	1	0	2	0	0	0	1	2	0	0	0	0	2	0	11
11:30 AM	3	3	0	0	2	3	0	0	2	2	0	0	1	0	0	0	16
11:45 AM	2	1	1	0	1	4	1	0	0	3	0	0	2	0	1	0	16
Total	8	8	2	0	7	8	1	0	3	9	0	0	3	0	4	0	53
12:00 PM	0	1	0	0	2	0	0	0	0	2	0	0	0	0	2	0	7
12:15 PM	0	0	0	0	1	0	0	0	0	2	0	0	1	0	0	0	4
12:30 PM	1	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	4
12:45 PM	0	1	0	0	1	1	0	0	0	2	0	0	1	0	0	0	6
Total	1	2	0	0	4	3	0	0	0	7	0	0	2	0	2	0	21
Grand Total	9	10	2	0	11	11	1	0	3	16	0	0	5	0	6	0	74
Apprch %	42.9	47.6	9.5	0	47.8	47.8	4.3	0	15.8	84.2	0	0	45.5	0	54.5	0	
Total %	12.2	13.5	2.7	0	14.9	14.9	1.4	0	4.1	21.6	0	0	6.8	0	8.1	0	

	Brewster-Chatham Road (Route 137) From North					Orleans-Harwich Road (Route 39) From East					Brewster-Chatham Road (Route 137) From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	**3**	1	0	0	4	**2**	1	0	0	3	0	2	0	0	2	0	0	1	0	1	10
11:15 AM	0	**3**	**1**	0	4	2	0	0	0	2	1	2	0	0	3	0	0	**2**	0	2	11
11:30 AM	3	3	0	0	**6**	2	3	0	0	5	**2**	2	0	0	**4**	1	0	0	0	1	**16**
11:45 AM	2	1	1	0	4	1	**4**	**1**	0	**6**	0	**3**	0	0	3	**2**	0	1	0	**3**	16
Total Volume	8	8	2	0	18	7	8	1	0	16	3	9	0	0	12	3	0	4	0	7	53
% App. Total	44.4	44.4	11.1	0		43.8	50	6.2	0		25	75	0	0		42.9	0	57.1	0		
PHF	.667	.667	.500	.000	.750	.875	.500	.250	.000	.667	.375	.750	.000	.000	.750	.375	.000	.500	.000	.583	.828

PRECISION
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N/S: Brewster-Chatham Road (Route 137)
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 AA
Site Code : 8200.15
Start Date : 7/11/2015
Page No : 1

Groups Printed- Peds and Bicycles

	Brewster-Chatham Road (Route 137) From North					Orleans-Harwich Road (Route 39) From East					Brewster-Chatham Road (Route 137) From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
11:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
11:30 AM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	4
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	1	0	0	0	0	0	5
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	4	0	0	0	0	3	0	0	0	0	0	7
Grand Total	2	0	0	0	0	0	1	0	0	4	0	0	0	0	3	0	0	0	0	1	11
Apprch %	100	0	0	0	0	0	20	0	0	80	0	0	0	0	100	0	0	0	0	100	
Total %	18.2	0	0	0	0	0	9.1	0	0	36.4	0	0	0	0	27.3	0	0	0	0	9.1	

	Brewster-Chatham Road (Route 137) From North						Orleans-Harwich Road (Route 39) From East						Brewster-Chatham Road (Route 137) From South						Orleans-Harwich Road (Route 39) From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 11:30 AM																									
11:30 AM	**2**	0	0	0	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	**4**	**4**	0	0	0	0	1	1	0	0	0	0	0	0	**5**
Total Volume	2	0	0	0	0	2	0	0	0	0	4	4	0	0	0	0	2	2	0	0	0	0	0	0	8
% App. Total	100	0	0	0	0		0	0	0	0	100		0	0	0	0	100		0	0	0	0	0		
PHF	.250	.000	.000	.000	.000	.250	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.400

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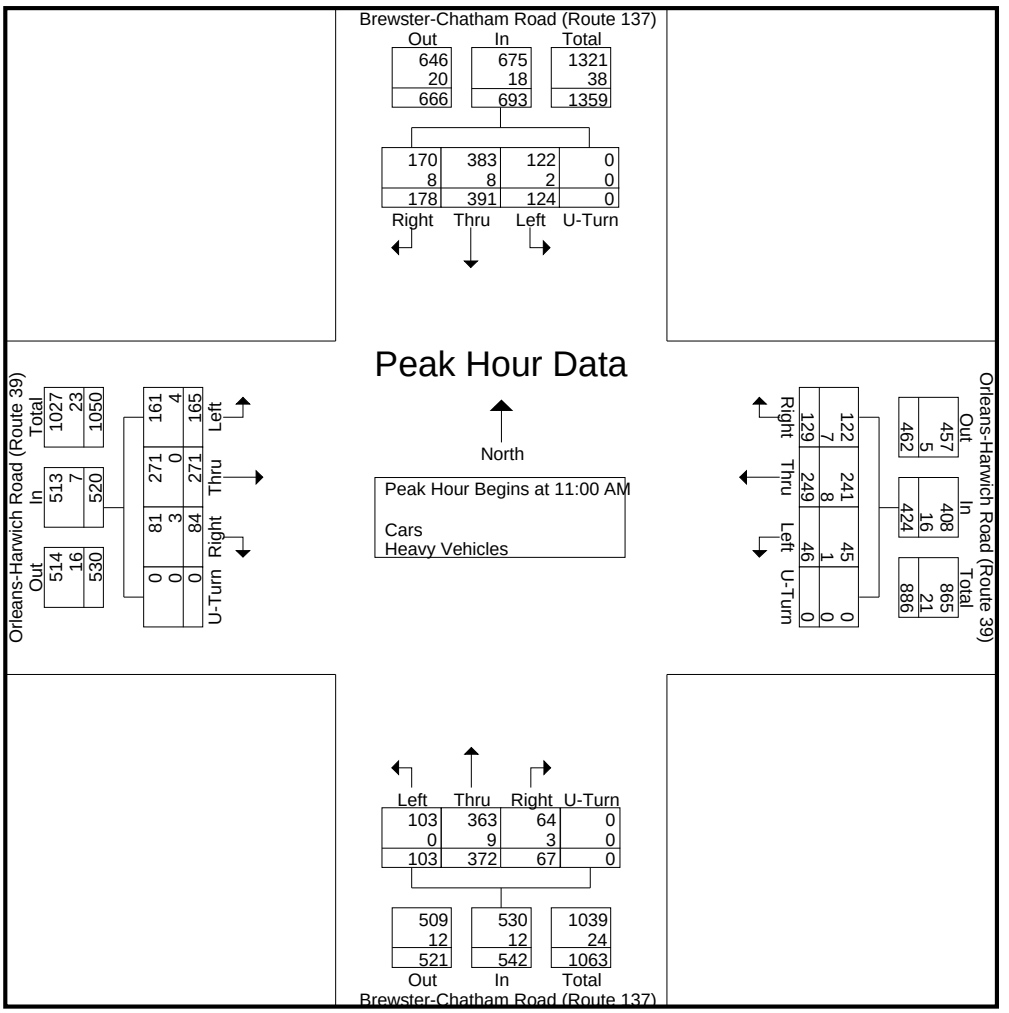
N/S: Brewster-Chatham Road (Route 137)
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 AA
Site Code : 8200.15
Start Date : 7/11/2015
Page No : 1

	Brewster-Chatham Road (Route 137) From North					Orleans-Harwich Road (Route 39) From East					Brewster-Chatham Road (Route 137) From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	**49**	112	28	0	189	31	56	**13**	0	100	16	**106**	25	0	**147**	17	**88**	43	0	**148**	**584**
11:15 AM	45	93	**33**	0	171	33	53	8	0	94	17	88	**33**	0	138	22	69	40	0	131	534
11:30 AM	44	**115**	32	0	**191**	31	**74**	12	0	**117**	**20**	87	20	0	127	**23**	67	37	0	127	562
11:45 AM	40	71	31	0	142	**34**	66	13	0	113	14	91	25	0	130	22	47	**45**	0	114	499
Total Volume	178	391	124	0	693	129	249	46	0	424	67	372	103	0	542	84	271	165	0	520	2179
% App. Total	25.7	56.4	17.9	0		30.4	58.7	10.8	0		12.4	68.6	19	0		16.2	52.1	31.7	0		
PHF	.908	.850	.939	.000	.907	.949	.841	.885	.000	.906	.838	.877	.780	.000	.922	.913	.770	.917	.000	.878	.933
Cars	170	383	122	0	675	122	241	45	0	408	64	363	103	0	530	81	271	161	0	513	2126
% Cars	95.5	98.0	98.4	0	97.4	94.6	96.8	97.8	0	96.2	95.5	97.6	100	0	97.8	96.4	100	97.6	0	98.7	97.6
Heavy Vehicles	8	8	2	0	18	7	8	1	0	16	3	9	0	0	12	3	0	4	0	7	53
% Heavy Vehicles	4.5	2.0	1.6	0	2.6	5.4	3.2	2.2	0	3.8	4.5	2.4	0	0	2.2	3.6	0	2.4	0	1.3	2.4



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N/S: Spences Trace/ Evergreen Cemetary
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 B
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Spences Trace From North				Orleans-Harwich Road (Route 39) From East				Evergreen Cemetary From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	0	1	0	0	142	0	0	0	0	0	0	0	136	0	0	279
04:15 PM	0	0	0	0	0	154	0	0	0	0	0	0	0	129	0	0	283
04:30 PM	0	0	0	0	0	143	2	0	0	0	1	0	0	118	0	0	264
04:45 PM	0	0	0	0	3	159	0	0	0	0	0	0	0	108	0	0	270
Total	0	0	1	0	3	598	2	0	0	0	1	0	0	491	0	0	1096
05:00 PM	0	0	0	0	0	137	0	0	0	0	0	0	0	119	0	0	256
05:15 PM	1	0	0	0	0	137	0	0	0	0	0	0	0	115	0	0	253
05:30 PM	0	0	0	0	0	101	0	0	0	0	0	0	0	104	0	0	205
05:45 PM	0	0	1	0	0	128	0	0	0	0	0	0	0	88	0	0	217
Total	1	0	1	0	0	503	0	0	0	0	0	0	0	426	0	0	931
Grand Total	1	0	2	0	3	1101	2	0	0	0	1	0	0	917	0	0	2027
Apprch %	33.3	0	66.7	0	0.3	99.5	0.2	0	0	0	100	0	0	100	0	0	
Total %	0	0	0.1	0	0.1	54.3	0.1	0	0	0	0	0	0	45.2	0	0	
Cars	1	0	2	0	3	1071	2	0	0	0	1	0	0	898	0	0	1978
% Cars	100	0	100	0	100	97.3	100	0	0	0	100	0	0	97.9	0	0	97.6
Heavy Vehicles	0	0	0	0	0	30	0	0	0	0	0	0	0	19	0	0	49
% Heavy Vehicles	0	0	0	0	0	2.7	0	0	0	0	0	0	0	2.1	0	0	2.4

	Spences Trace From North					Orleans-Harwich Road (Route 39) From East					Evergreen Cemetary From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	**1**	0	**1**	0	142	0	0	142	0	0	0	0	0	0	**136**	0	0	**136**	279
04:15 PM	0	0	0	0	0	0	154	0	0	154	0	0	0	0	0	0	129	0	0	129	**283**
04:30 PM	0	0	0	0	0	0	143	**2**	0	145	0	0	**1**	0	**1**	0	118	0	0	118	264
04:45 PM	0	0	0	0	0	**3**	**159**	0	0	**162**	0	0	0	0	0	0	108	0	0	108	270
Total Volume	0	0	1	0	1	3	598	2	0	603	0	0	1	0	1	0	491	0	0	491	1096
% App. Total	0	0	100	0		0.5	99.2	0.3	0		0	0	100	0		0	100	0	0		
PHF	.000	.000	.250	.000	.250	.250	.940	.250	.000	.931	.000	.000	.250	.000	.250	.000	.903	.000	.000	.903	.968
Cars	0	0	1	0	1	3	575	2	0	580	0	0	1	0	1	0	479	0	0	479	1061
% Cars	0	0	100	0	100	100	96.2	100	0	96.2	0	0	100	0	100	0	97.6	0	0	97.6	96.8
Heavy Vehicles	0	0	0	0	0	0	23	0	0	23	0	0	0	0	0	0	12	0	0	12	35
% Heavy Vehicles	0	0	0	0	0	0	3.8	0	0	3.8	0	0	0	0	0	0	2.4	0	0	2.4	3.2

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N/S: Spences Trace/ Evergreen Cemetary
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 B
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

Groups Printed- Cars

	Spences Trace From North				Orleans-Harwich Road (Route 39) From East				Evergreen Cemetary From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	0	1	0	0	138	0	0	0	0	0	0	0	133	0	0	272
04:15 PM	0	0	0	0	0	144	0	0	0	0	0	0	0	127	0	0	271
04:30 PM	0	0	0	0	0	141	2	0	0	0	1	0	0	114	0	0	258
04:45 PM	0	0	0	0	3	152	0	0	0	0	0	0	0	105	0	0	260
Total	0	0	1	0	3	575	2	0	0	0	1	0	0	479	0	0	1061
05:00 PM	0	0	0	0	0	135	0	0	0	0	0	0	0	116	0	0	251
05:15 PM	1	0	0	0	0	136	0	0	0	0	0	0	0	114	0	0	251
05:30 PM	0	0	0	0	0	99	0	0	0	0	0	0	0	102	0	0	201
05:45 PM	0	0	1	0	0	126	0	0	0	0	0	0	0	87	0	0	214
Total	1	0	1	0	0	496	0	0	0	0	0	0	0	419	0	0	917
Grand Total	1	0	2	0	3	1071	2	0	0	0	1	0	0	898	0	0	1978
Apprch %	33.3	0	66.7	0	0.3	99.5	0.2	0	0	0	100	0	0	100	0	0	
Total %	0.1	0	0.1	0	0.2	54.1	0.1	0	0	0	0.1	0	0	45.4	0	0	

	Spences Trace From North					Orleans-Harwich Road (Route 39) From East					Evergreen Cemetary From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	**1**	0	**1**	0	138	0	0	138	0	0	0	0	0	0	**133**	0	0	**133**	**272**
04:15 PM	0	0	0	0	0	0	144	0	0	144	0	0	0	0	0	0	127	0	0	127	271
04:30 PM	0	0	0	0	0	0	141	**2**	0	143	0	0	**1**	0	**1**	0	114	0	0	114	258
04:45 PM	0	0	0	0	0	**3**	**152**	0	0	**155**	0	0	0	0	0	0	105	0	0	105	260
Total Volume	0	0	1	0	1	3	575	2	0	580	0	0	1	0	1	0	479	0	0	479	1061
% App. Total	0	0	100	0		0.5	99.1	0.3	0		0	0	100	0		0	100	0	0		
PHF	.000	.000	.250	.000	.250	.250	.946	.250	.000	.935	.000	.000	.250	.000	.250	.000	.900	.000	.000	.900	.975

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E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 B
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

Groups Printed- Heavy Vehicles

	Spences Trace From North				Orleans-Harwich Road (Route 39) From East				Evergreen Cemetary From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	3	0	0	7
04:15 PM	0	0	0	0	0	10	0	0	0	0	0	0	0	2	0	0	12
04:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0	6
04:45 PM	0	0	0	0	0	7	0	0	0	0	0	0	0	3	0	0	10
Total	0	0	0	0	0	23	0	0	0	0	0	0	0	12	0	0	35
05:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0	5
05:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
05:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
05:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	3
Total	0	0	0	0	0	7	0	0	0	0	0	0	0	7	0	0	14
Grand Total	0	0	0	0	0	30	0	0	0	0	0	0	0	19	0	0	49
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	61.2	0	0	0	0	0	0	0	38.8	0	0	

	Spences Trace From North					Orleans-Harwich Road (Route 39) From East					Evergreen Cemetary From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
04:15 PM	0	0	0	0	0	0	**10**	0	0	**10**	0	0	0	0	0	0	2	0	0	2	**12**
04:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	**4**	0	0	**4**	6
04:45 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	3	0	0	3	10
Total Volume	0	0	0	0	0	0	23	0	0	23	0	0	0	0	0	0	12	0	0	12	35
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.575	.000	.000	.575	.000	.000	.000	.000	.000	.000	.750	.000	.000	.750	.729

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Page No : 1

Groups Printed- Peds and Bicycles

	Spences Trace From North					Orleans-Harwich Road (Route 39) From East					Evergreen Cemetary From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	2	1	0	0	0	0	0	5
Total	0	0	0	0	0	0	3	0	0	0	0	0	0	2	1	0	0	0	0	0	6
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	3	0	0	0	0	0	0	2	1	0	0	0	0	0	6
Apprch %	0	0	0	0	0	0	100	0	0	0	0	0	0	66.7	33.3	0	0	0	0	0	
Total %	0	0	0	0	0	0	50	0	0	0	0	0	0	33.3	16.7	0	0	0	0	0	

	Spences Trace From North						Orleans-Harwich Road (Route 39) From East						Evergreen Cemetary From South						Orleans-Harwich Road (Route 39) From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:00 PM																									
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	**2**	0	0	0	**2**	0	0	0	**2**	**1**	**3**	0	0	0	0	0	0	**5**
Total Volume	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	2	1	3	0	0	0	0	0	0	6
% App. Total	0	0	0	0	0		0	100	0	0	0		0	0	0	66.7	33.3		0	0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.375	.000	.000	.000	.375	.000	.000	.000	.250	.250	.250	.000	.000	.000	.000	.000	.000	.300

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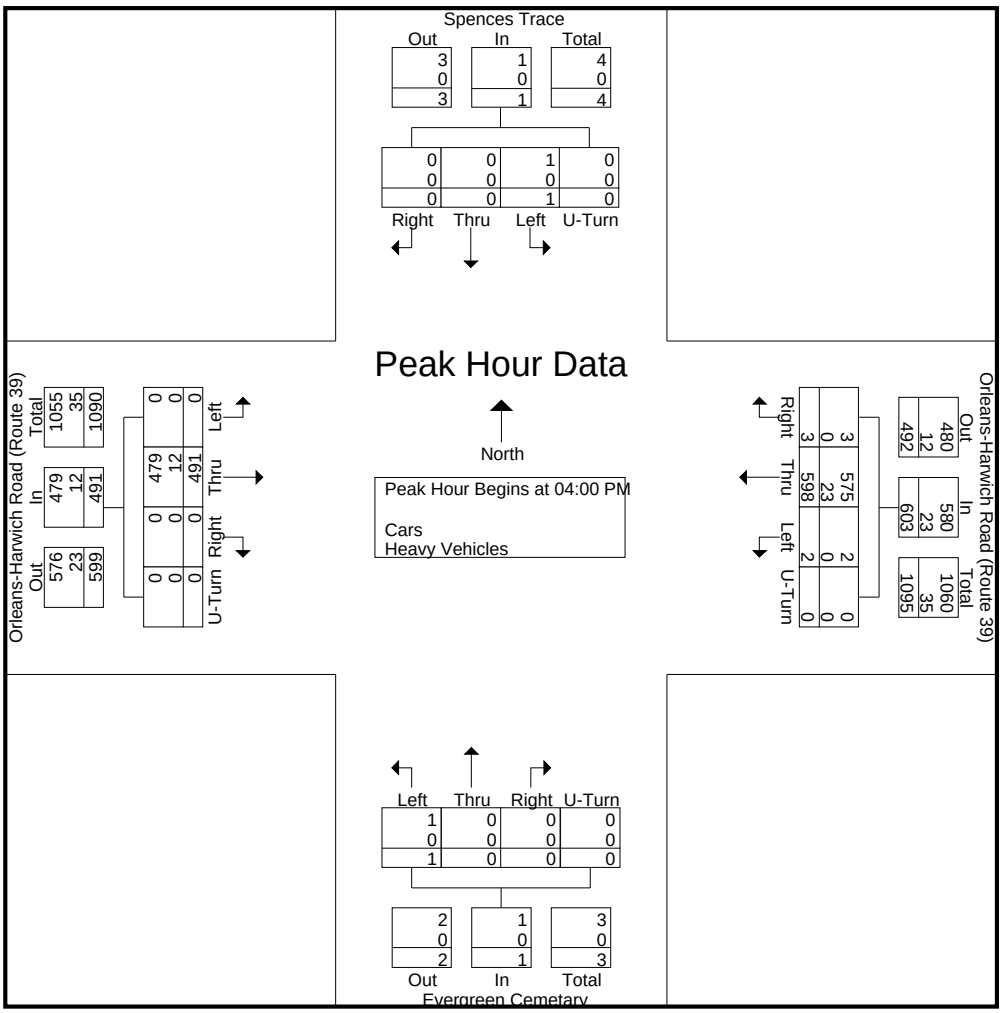
N/S: Spences Trace/ Evergreen Cemetary
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 B
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

	Spences Trace From North					Orleans-Harwich Road (Route 39) From East					Evergreen Cemetary From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	**1**	0	**1**	0	142	0	0	142	0	0	0	0	0	0	**136**	0	0	**136**	279
04:15 PM	0	0	0	0	0	0	154	0	0	154	0	0	0	0	0	0	129	0	0	129	**283**
04:30 PM	0	0	0	0	0	0	143	**2**	0	145	0	0	**1**	0	**1**	0	118	0	0	118	264
04:45 PM	0	0	0	0	0	**3**	**159**	0	0	**162**	0	0	0	0	0	0	108	0	0	108	270
Total Volume	0	0	1	0	1	3	598	2	0	603	0	0	1	0	1	0	491	0	0	491	1096
% App. Total	0	0	100	0		0.5	99.2	0.3	0		0	0	100	0		0	100	0	0		
PHF	.000	.000	.250	.000	.250	.250	.940	.250	.000	.931	.000	.000	.250	.000	.250	.000	.903	.000	.000	.903	.968
Cars	0	0	1	0	1	3	575	2	0	580	0	0	1	0	1	0	479	0	0	479	1061
% Cars	0	0	100	0	100	100	96.2	100	0	96.2	0	0	100	0	100	0	97.6	0	0	97.6	96.8
Heavy Vehicles	0	0	0	0	0	0	23	0	0	23	0	0	0	0	0	0	12	0	0	12	35
% Heavy Vehicles	0	0	0	0	0	0	3.8	0	0	3.8	0	0	0	0	0	0	2.4	0	0	2.4	3.2



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N/S: Spences Trace/ Evergreen Cemetary
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 BB
Site Code : 8200.15
Start Date : 7/11/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Spences Trace From North				Orleans-Harwich Road (Route 39) From East				Evergreen Cemetary From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
11:00 AM	1	0	1	0	2	126	0	0	0	0	0	0	0	137	0	0	267
11:15 AM	0	0	0	0	0	120	0	0	0	0	1	0	0	131	0	0	252
11:30 AM	0	0	0	0	0	133	0	0	0	0	0	0	0	123	0	0	256
11:45 AM	0	0	1	0	0	115	0	0	0	0	0	0	0	116	1	0	233
Total	1	0	2	0	2	494	0	0	0	0	1	0	0	507	1	0	1008
12:00 PM	1	0	1	0	0	128	0	0	0	0	0	0	1	83	0	0	214
12:15 PM	0	0	0	0	0	116	0	0	1	0	0	0	0	124	0	0	241
12:30 PM	0	0	1	0	0	107	2	0	0	0	1	0	1	121	1	0	234
12:45 PM	0	0	0	0	0	95	0	0	1	0	1	0	0	108	0	0	205
Total	1	0	2	0	0	446	2	0	2	0	2	0	2	436	1	0	894
Grand Total	2	0	4	0	2	940	2	0	2	0	3	0	2	943	2	0	1902
Apprch %	33.3	0	66.7	0	0.2	99.6	0.2	0	40	0	60	0	0.2	99.6	0.2	0	
Total %	0.1	0	0.2	0	0.1	49.4	0.1	0	0.1	0	0.2	0	0.1	49.6	0.1	0	
Cars	2	0	4	0	2	919	2	0	2	0	3	0	2	933	2	0	1871
% Cars	100	0	100	0	100	97.8	100	0	100	0	100	0	100	98.9	100	0	98.4
Heavy Vehicles	0	0	0	0	0	21	0	0	0	0	0	0	0	10	0	0	31
% Heavy Vehicles	0	0	0	0	0	2.2	0	0	0	0	0	0	0	1.1	0	0	1.6

	Spences Trace From North					Orleans-Harwich Road (Route 39) From East					Evergreen Cemetary From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	**1**	0	**1**	0	**2**	**2**	126	0	0	128	0	0	0	0	0	0	**137**	0	0	**137**	**267**
11:15 AM	0	0	0	0	0	0	120	0	0	120	0	0	**1**	0	**1**	0	131	0	0	131	252
11:30 AM	0	0	0	0	0	0	**133**	0	0	**133**	0	0	0	0	0	0	123	0	0	123	256
11:45 AM	0	0	1	0	1	0	115	0	0	115	0	0	0	0	0	0	116	**1**	0	117	233
Total Volume	1	0	2	0	3	2	494	0	0	496	0	0	1	0	1	0	507	1	0	508	1008
% App. Total	33.3	0	66.7	0		0.4	99.6	0	0		0	0	100	0		0	99.8	0.2	0		
PHF	.250	.000	.500	.000	.375	.250	.929	.000	.000	.932	.000	.000	.250	.000	.250	.000	.925	.250	.000	.927	.944
Cars	1	0	2	0	3	2	481	0	0	483	0	0	1	0	1	0	503	1	0	504	991
% Cars	100	0	100	0	100	100	97.4	0	0	97.4	0	0	100	0	100	0	99.2	100	0	99.2	98.3
Heavy Vehicles	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	0	4	0	0	4	17
% Heavy Vehicles	0	0	0	0	0	0	2.6	0	0	2.6	0	0	0	0	0	0	0.8	0	0	0.8	1.7

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E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 BB
Site Code : 8200.15
Start Date : 7/11/2015
Page No : 1

Groups Printed- Cars

	Spences Trace From North				Orleans-Harwich Road (Route 39) From East				Evergreen Cemetary From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
11:00 AM	1	0	1	0	2	122	0	0	0	0	0	0	0	137	0	0	263
11:15 AM	0	0	0	0	0	119	0	0	0	0	1	0	0	129	0	0	249
11:30 AM	0	0	0	0	0	129	0	0	0	0	0	0	0	123	0	0	252
11:45 AM	0	0	1	0	0	111	0	0	0	0	0	0	0	114	1	0	227
Total	1	0	2	0	2	481	0	0	0	0	1	0	0	503	1	0	991
12:00 PM	1	0	1	0	0	125	0	0	0	0	0	0	1	81	0	0	209
12:15 PM	0	0	0	0	0	114	0	0	1	0	0	0	0	122	0	0	237
12:30 PM	0	0	1	0	0	106	2	0	0	0	1	0	1	121	1	0	233
12:45 PM	0	0	0	0	0	93	0	0	1	0	1	0	0	106	0	0	201
Total	1	0	2	0	0	438	2	0	2	0	2	0	2	430	1	0	880
Grand Total	2	0	4	0	2	919	2	0	2	0	3	0	2	933	2	0	1871
Apprch %	33.3	0	66.7	0	0.2	99.6	0.2	0	40	0	60	0	0.2	99.6	0.2	0	
Total %	0.1	0	0.2	0	0.1	49.1	0.1	0	0.1	0	0.2	0	0.1	49.9	0.1	0	

	Spences Trace From North					Orleans-Harwich Road (Route 39) From East					Evergreen Cemetary From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	**1**	0	**1**	0	**2**	**2**	122	0	0	124	0	0	0	0	0	0	**137**	0	0	**137**	**263**
11:15 AM	0	0	0	0	0	0	119	0	0	119	0	0	**1**	0	**1**	0	129	0	0	129	249
11:30 AM	0	0	0	0	0	0	**129**	0	0	**129**	0	0	0	0	0	0	123	0	0	123	252
11:45 AM	0	0	1	0	1	0	111	0	0	111	0	0	0	0	0	0	114	**1**	0	115	227
Total Volume	1	0	2	0	3	2	481	0	0	483	0	0	1	0	1	0	503	1	0	504	991
% App. Total	33.3	0	66.7	0		0.4	99.6	0	0		0	0	100	0		0	99.8	0.2	0		
PHF	.250	.000	.500	.000	.375	.250	.932	.000	.000	.936	.000	.000	.250	.000	.250	.000	.918	.250	.000	.920	.942

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E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 BB
Site Code : 8200.15
Start Date : 7/11/2015
Page No : 1

Groups Printed- Heavy Vehicles

	Spences Trace From North				Orleans-Harwich Road (Route 39) From East				Evergreen Cemetary From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
11:00 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
11:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
11:30 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
11:45 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	2	0	0	6
Total	0	0	0	0	0	13	0	0	0	0	0	0	0	4	0	0	17
12:00 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0	0	5
12:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
12:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
Total	0	0	0	0	0	8	0	0	0	0	0	0	0	6	0	0	14
Grand Total	0	0	0	0	0	21	0	0	0	0	0	0	0	10	0	0	31
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	67.7	0	0	0	0	0	0	0	32.3	0	0	

	Spences Trace From North					Orleans-Harwich Road (Route 39) From East					Evergreen Cemetary From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	0	0	0	0	0	0	**4**	0	0	**4**	0	0	0	0	0	0	0	0	0	0	4
11:45 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	**2**	0	0	**2**	**6**
12:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
12:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
Total Volume	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	0	6	0	0	6	19
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.813	.000	.000	.813	.000	.000	.000	.000	.000	.000	.750	.000	.000	.750	.792

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City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 BB
Site Code : 8200.15
Start Date : 7/11/2015
Page No : 1

Groups Printed- Peds and Bicycles

	Spences Trace From North					Orleans-Harwich Road (Route 39) From East					Evergreen Cemetary From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
11:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	3
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	4
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	4
Apprch %	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	100	0	0	0	
Total %	0	0	0	0	0	0	75	0	0	0	0	0	0	0	0	0	25	0	0	0	

	Spences Trace From North						Orleans-Harwich Road (Route 39) From East						Evergreen Cemetary From South						Orleans-Harwich Road (Route 39) From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 11:00 AM																									
11:00 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	**2**	0	0	0	**2**	0	0	0	0	0	0	0	**1**	0	0	0	**1**	**3**
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	1	4
% App. Total	0	0	0	0	0		0	100	0	0	0		0	0	0	0	0		0	100	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.375	.000	.000	.000	.375	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.000	.250	.333

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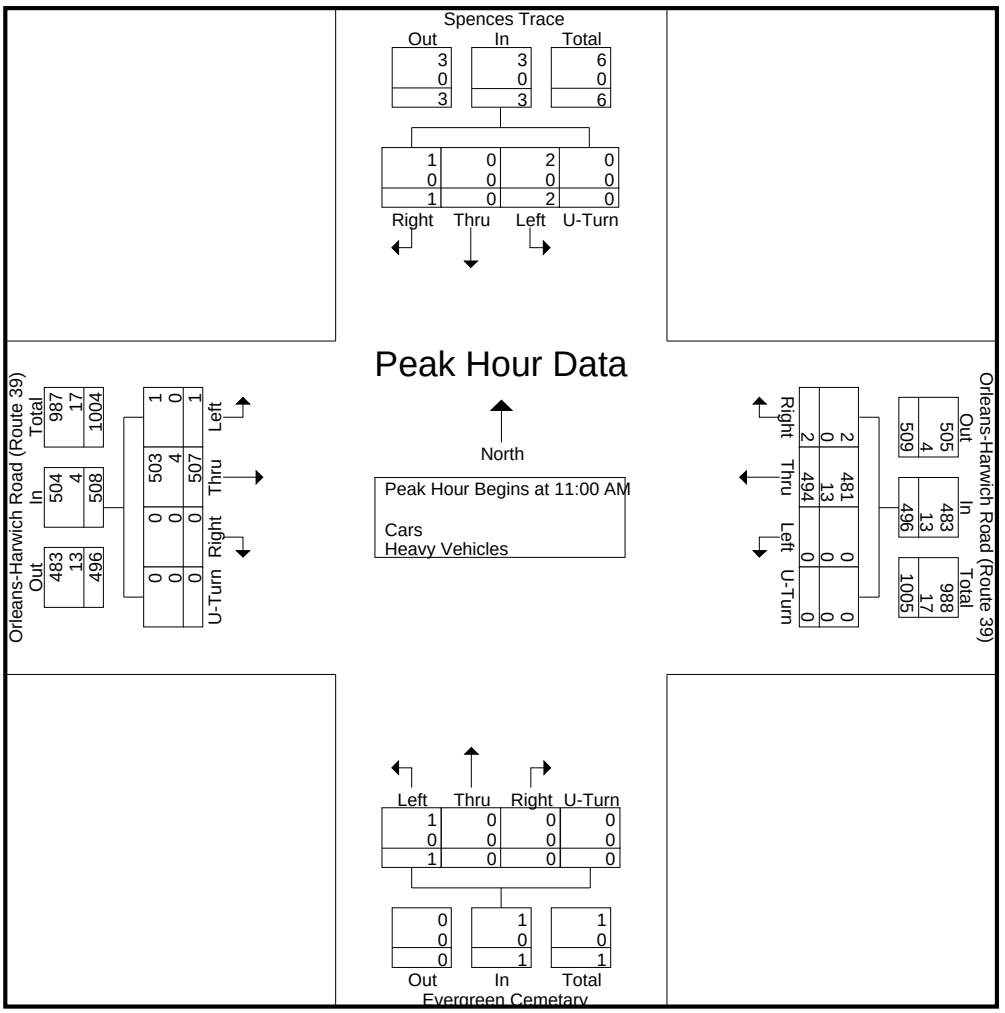
File Name : 154558 BB
Site Code : 8200.15
Start Date : 7/11/2015
Page No : 1

	Spences Trace From North					Orleans-Harwich Road (Route 39) From East					Evergreen Cemetary From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	**1**	0	**1**	0	**2**	**2**	126	0	0	128	0	0	0	0	0	0	**137**	0	0	**137**	**267**
11:15 AM	0	0	0	0	0	0	120	0	0	120	0	0	**1**	0	**1**	0	131	0	0	131	252
11:30 AM	0	0	0	0	0	0	**133**	0	0	**133**	0	0	0	0	0	0	123	0	0	123	256
11:45 AM	0	0	1	0	1	0	115	0	0	115	0	0	0	0	0	0	116	**1**	0	117	233
Total Volume	1	0	2	0	3	2	494	0	0	496	0	0	1	0	1	0	507	1	0	508	1008
% App. Total	33.3	0	66.7	0		0.4	99.6	0	0		0	0	100	0		0	99.8	0.2	0		
PHF	.250	.000	.500	.000	.375	.250	.929	.000	.000	.932	.000	.000	.250	.000	.250	.000	.925	.250	.000	.927	.944
Cars	1	0	2	0	3	2	481	0	0	483	0	0	1	0	1	0	503	1	0	504	991
% Cars	100	0	100	0	100	100	97.4	0	0	97.4	0	0	100	0	100	0	99.2	100	0	99.2	98.3
Heavy Vehicles	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	0	4	0	0	4	17
% Heavy Vehicles	0	0	0	0	0	0	2.6	0	0	2.6	0	0	0	0	0	0	0.8	0	0	0.8	1.7



PRECISION
D A T A
INDUSTRIES, LLC
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S: Somerset Road
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 C
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Orleans-Harwich Road (Route 39) From East			Somerset Road From South			Orleans-Harwich Road (Route 39) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
04:00 PM	142	0	0	1	0	0	1	135	0	279
04:15 PM	155	0	0	0	0	0	0	136	0	291
04:30 PM	144	1	0	2	0	0	0	112	0	259
04:45 PM	156	2	0	0	1	0	0	111	0	270
Total	597	3	0	3	1	0	1	494	0	1099
05:00 PM	135	0	0	0	0	0	0	116	0	251
05:15 PM	138	0	0	0	0	0	0	114	0	252
05:30 PM	103	0	0	1	0	0	0	100	0	204
05:45 PM	125	2	0	1	0	0	0	88	0	216
Total	501	2	0	2	0	0	0	418	0	923
Grand Total	1098	5	0	5	1	0	1	912	0	2022
Apprch %	99.5	0.5	0	83.3	16.7	0	0.1	99.9	0	
Total %	54.3	0.2	0	0.2	0	0	0	45.1	0	
Cars	1068	5	0	5	1	0	1	893	0	1973
% Cars	97.3	100	0	100	100	0	100	97.9	0	97.6
Heavy Vehicles	30	0	0	0	0	0	0	19	0	49
% Heavy Vehicles	2.7	0	0	0	0	0	0	2.1	0	2.4

	Orleans-Harwich Road (Route 39) From East				Somerset Road From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	142	0	0	142	1	0	0	1	**1**	135	0	**136**	279
04:15 PM	155	0	0	155	0	0	0	0	0	**136**	0	136	**291**
04:30 PM	144	1	0	145	**2**	0	0	**2**	0	112	0	112	259
04:45 PM	**156**	**2**	0	**158**	0	**1**	0	1	0	111	0	111	270
Total Volume	597	3	0	600	3	1	0	4	1	494	0	495	1099
% App. Total	99.5	0.5	0		75	25	0		0.2	99.8	0		
PHF	.957	.375	.000	.949	.375	.250	.000	.500	.250	.908	.000	.910	.944
Cars	574	3	0	577	3	1	0	4	1	482	0	483	1064
% Cars	96.1	100	0	96.2	100	100	0	100	100	97.6	0	97.6	96.8
Heavy Vehicles	23	0	0	23	0	0	0	0	0	12	0	12	35
% Heavy Vehicles	3.9	0	0	3.8	0	0	0	0	0	2.4	0	2.4	3.2

PRECISION
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S: Somerset Road
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 C
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

Groups Printed- Cars

	Orleans-Harwich Road (Route 39) From East			Somerset Road From South			Orleans-Harwich Road (Route 39) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
04:00 PM	138	0	0	1	0	0	1	132	0	272
04:15 PM	145	0	0	0	0	0	0	134	0	279
04:30 PM	142	1	0	2	0	0	0	108	0	253
04:45 PM	149	2	0	0	1	0	0	108	0	260
Total	574	3	0	3	1	0	1	482	0	1064
05:00 PM	133	0	0	0	0	0	0	113	0	246
05:15 PM	137	0	0	0	0	0	0	113	0	250
05:30 PM	101	0	0	1	0	0	0	98	0	200
05:45 PM	123	2	0	1	0	0	0	87	0	213
Total	494	2	0	2	0	0	0	411	0	909
Grand Total	1068	5	0	5	1	0	1	893	0	1973
Apprch %	99.5	0.5	0	83.3	16.7	0	0.1	99.9	0	
Total %	54.1	0.3	0	0.3	0.1	0	0.1	45.3	0	

	Orleans-Harwich Road (Route 39) From East				Somerset Road From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	138	0	0	138	1	0	0	1	**1**	132	0	133	272
04:15 PM	145	0	0	145	0	0	0	0	0	**134**	0	**134**	**279**
04:30 PM	142	1	0	143	**2**	0	0	**2**	0	108	0	108	253
04:45 PM	**149**	**2**	0	**151**	0	**1**	0	1	0	108	0	108	260
Total Volume	574	3	0	577	3	1	0	4	1	482	0	483	1064
% App. Total	99.5	0.5	0		75	25	0		0.2	99.8	0		
PHF	.963	.375	.000	.955	.375	.250	.000	.500	.250	.899	.000	.901	.953

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S: Somerset Road
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 C
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

Groups Printed- Heavy Vehicles

	Orleans-Harwich Road (Route 39) From East			Somerset Road From South			Orleans-Harwich Road (Route 39) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
04:00 PM	4	0	0	0	0	0	0	3	0	7
04:15 PM	10	0	0	0	0	0	0	2	0	12
04:30 PM	2	0	0	0	0	0	0	4	0	6
04:45 PM	7	0	0	0	0	0	0	3	0	10
Total	23	0	0	0	0	0	0	12	0	35
05:00 PM	2	0	0	0	0	0	0	3	0	5
05:15 PM	1	0	0	0	0	0	0	1	0	2
05:30 PM	2	0	0	0	0	0	0	2	0	4
05:45 PM	2	0	0	0	0	0	0	1	0	3
Total	7	0	0	0	0	0	0	7	0	14
Grand Total	30	0	0	0	0	0	0	19	0	49
Apprch %	100	0	0	0	0	0	0	100	0	
Total %	61.2	0	0	0	0	0	0	38.8	0	

	Orleans-Harwich Road (Route 39) From East				Somerset Road From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	4	0	0	4	0	0	0	0	0	3	0	3	7
04:15 PM	**10**	0	0	**10**	0	0	0	0	0	2	0	2	**12**
04:30 PM	2	0	0	2	0	0	0	0	0	**4**	0	**4**	6
04:45 PM	7	0	0	7	0	0	0	0	0	3	0	3	10
Total Volume	23	0	0	23	0	0	0	0	0	12	0	12	35
% App. Total	100	0	0		0	0	0		0	100	0		
PHF	.575	.000	.000	.575	.000	.000	.000	.000	.000	.750	.000	.750	.729

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S: Somerset Road
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 C
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

Groups Printed- Peds and Bicycles

	Orleans-Harwich Road (Route 39) From East				Somerset Road From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Thru	Left	Peds SB	Peds NB	Right	Left	Peds WB	Peds EB	Right	Thru	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	2	0	0	0	0	0	2	1	0	0	1	0	6
Total	3	0	0	0	0	0	2	1	0	0	1	0	7
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	3	0	0	0	0	0	2	1	0	0	1	0	7
Apprch %	100	0	0	0	0	0	66.7	33.3	0	0	100	0	
Total %	42.9	0	0	0	0	0	28.6	14.3	0	0	14.3	0	

	Orleans-Harwich Road (Route 39) From East					Somerset Road From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Thru	Left	Peds SB	Peds NB	App. Total	Right	Left	Peds WB	Peds EB	App. Total	Right	Thru	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 04:00 PM																
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	**2**	0	0	0	**2**	0	0	**2**	**1**	**3**	0	0	**1**	0	**1**	**6**
Total Volume	3	0	0	0	3	0	0	2	1	3	0	0	1	0	1	7
% App. Total	100	0	0	0		0	0	66.7	33.3		0	0	100	0		
PHF	.375	.000	.000	.000	.375	.000	.000	.250	.250	.250	.000	.000	.250	.000	.250	.292

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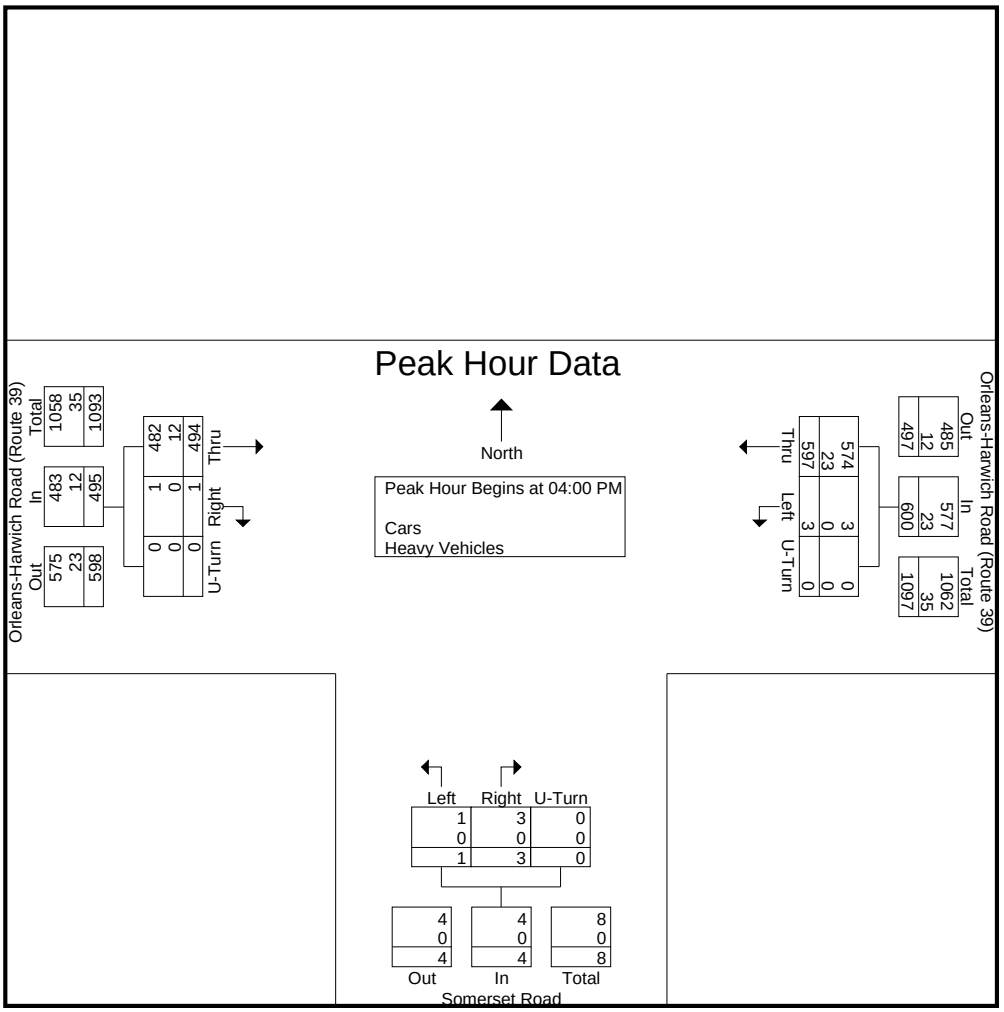
S: Somerset Road
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 C
Site Code : 8200.15
Start Date : 7/9/2015
Page No : 1

	Orleans-Harwich Road (Route 39) From East				Somerset Road From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	142	0	0	142	1	0	0	1	**1**	135	0	**136**	279
04:15 PM	155	0	0	155	0	0	0	0	0	**136**	0	136	**291**
04:30 PM	144	1	0	145	**2**	0	0	**2**	0	112	0	112	259
04:45 PM	**156**	**2**	0	**158**	0	**1**	0	1	0	111	0	111	270
Total Volume	597	3	0	600	3	1	0	4	1	494	0	495	1099
% App. Total	99.5	0.5	0		75	25	0		0.2	99.8	0		
PHF	.957	.375	.000	.949	.375	.250	.000	.500	.250	.908	.000	.910	.944
Cars	574	3	0	577	3	1	0	4	1	482	0	483	1064
% Cars	96.1	100	0	96.2	100	100	0	100	100	97.6	0	97.6	96.8
Heavy Vehicles	23	0	0	23	0	0	0	0	0	12	0	12	35
% Heavy Vehicles	3.9	0	0	3.8	0	0	0	0	0	2.4	0	2.4	3.2



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S: Somerset Road
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File Name : 154558 CC
Site Code : 8200.15
Start Date : 7/11/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Orleans-Harwich Road (Route 39) From East			Somerset Road From South			Orleans-Harwich Road (Route 39) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
11:00 AM	127	0	0	0	0	0	0	137	0	264
11:15 AM	121	1	0	0	0	0	0	132	0	254
11:30 AM	132	1	0	1	1	0	1	121	0	257
11:45 AM	115	0	0	0	0	0	1	117	0	233
Total	495	2	0	1	1	0	2	507	0	1008
12:00 PM	128	2	0	1	1	0	1	82	0	215
12:15 PM	115	0	0	0	1	0	1	123	0	240
12:30 PM	109	0	0	0	1	0	0	123	0	233
12:45 PM	96	0	0	1	0	0	0	107	0	204
Total	448	2	0	2	3	0	2	435	0	892
Grand Total	943	4	0	3	4	0	4	942	0	1900
Apprch %	99.6	0.4	0	42.9	57.1	0	0.4	99.6	0	
Total %	49.6	0.2	0	0.2	0.2	0	0.2	49.6	0	
Cars	922	4	0	3	4	0	4	932	0	1869
% Cars	97.8	100	0	100	100	0	100	98.9	0	98.4
Heavy Vehicles	21	0	0	0	0	0	0	10	0	31
% Heavy Vehicles	2.2	0	0	0	0	0	0	1.1	0	1.6

	Orleans-Harwich Road (Route 39) From East				Somerset Road From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:00 AM													
11:00 AM	127	0	0	127	0	0	0	0	0	**137**	0	**137**	**264**
11:15 AM	121	**1**	0	122	0	0	0	0	0	132	0	132	254
11:30 AM	**132**	1	0	**133**	**1**	**1**	0	**2**	**1**	121	0	122	257
11:45 AM	115	0	0	115	0	0	0	0	1	117	0	118	233
Total Volume	495	2	0	497	1	1	0	2	2	507	0	509	1008
% App. Total	99.6	0.4	0		50	50	0		0.4	99.6	0		
PHF	.938	.500	.000	.934	.250	.250	.000	.250	.500	.925	.000	.929	.955
Cars	482	2	0	484	1	1	0	2	2	503	0	505	991
% Cars	97.4	100	0	97.4	100	100	0	100	100	99.2	0	99.2	98.3
Heavy Vehicles	13	0	0	13	0	0	0	0	0	4	0	4	17
% Heavy Vehicles	2.6	0	0	2.6	0	0	0	0	0	0.8	0	0.8	1.7

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S: Somerset Road
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City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 CC
Site Code : 8200.15
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Page No : 1

Groups Printed- Cars

	Orleans-Harwich Road (Route 39) From East			Somerset Road From South			Orleans-Harwich Road (Route 39) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
11:00 AM	123	0	0	0	0	0	0	137	0	260
11:15 AM	120	1	0	0	0	0	0	130	0	251
11:30 AM	127	1	0	1	1	0	1	121	0	252
11:45 AM	112	0	0	0	0	0	1	115	0	228
Total	482	2	0	1	1	0	2	503	0	991
12:00 PM	125	2	0	1	1	0	1	80	0	210
12:15 PM	113	0	0	0	1	0	1	122	0	237
12:30 PM	108	0	0	0	1	0	0	122	0	231
12:45 PM	94	0	0	1	0	0	0	105	0	200
Total	440	2	0	2	3	0	2	429	0	878
Grand Total	922	4	0	3	4	0	4	932	0	1869
Apprch %	99.6	0.4	0	42.9	57.1	0	0.4	99.6	0	
Total %	49.3	0.2	0	0.2	0.2	0	0.2	49.9	0	

	Orleans-Harwich Road (Route 39) From East				Somerset Road From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:00 AM													
11:00 AM	123	0	0	123	0	0	0	0	0	**137**	0	**137**	**260**
11:15 AM	120	**1**	0	121	0	0	0	0	0	130	0	130	251
11:30 AM	**127**	1	0	**128**	**1**	**1**	0	**2**	**1**	121	0	122	252
11:45 AM	112	0	0	112	0	0	0	0	1	115	0	116	228
Total Volume	482	2	0	484	1	1	0	2	2	503	0	505	991
% App. Total	99.6	0.4	0		50	50	0		0.4	99.6	0		
PHF	.949	.500	.000	.945	.250	.250	.000	.250	.500	.918	.000	.922	.953

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Page No : 1

Groups Printed- Heavy Vehicles

	Orleans-Harwich Road (Route 39) From East			Somerset Road From South			Orleans-Harwich Road (Route 39) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
11:00 AM	4	0	0	0	0	0	0	0	0	4
11:15 AM	1	0	0	0	0	0	0	2	0	3
11:30 AM	5	0	0	0	0	0	0	0	0	5
11:45 AM	3	0	0	0	0	0	0	2	0	5
Total	13	0	0	0	0	0	0	4	0	17
12:00 PM	3	0	0	0	0	0	0	2	0	5
12:15 PM	2	0	0	0	0	0	0	1	0	3
12:30 PM	1	0	0	0	0	0	0	1	0	2
12:45 PM	2	0	0	0	0	0	0	2	0	4
Total	8	0	0	0	0	0	0	6	0	14
Grand Total	21	0	0	0	0	0	0	10	0	31
Apprch %	100	0	0	0	0	0	0	100	0	
Total %	67.7	0	0	0	0	0	0	32.3	0	

	Orleans-Harwich Road (Route 39) From East				Somerset Road From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:15 AM													
11:15 AM	1	0	0	1	0	0	0	0	0	**2**	0	**2**	3
11:30 AM	**5**	0	0	**5**	0	0	0	0	0	0	0	0	**5**
11:45 AM	3	0	0	3	0	0	0	0	0	2	0	2	5
12:00 PM	3	0	0	3	0	0	0	0	0	2	0	2	5
Total Volume	12	0	0	12	0	0	0	0	0	6	0	6	18
% App. Total	100	0	0		0	0	0		0	100	0		
PHF	.600	.000	.000	.600	.000	.000	.000	.000	.000	.750	.000	.750	.900

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

S: Somerset Road
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 CC
Site Code : 8200.15
Start Date : 7/11/2015
Page No : 1

Groups Printed- Peds and Bicycles

	Orleans-Harwich Road (Route 39) From East				Somerset Road From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Thru	Left	Peds SB	Peds NB	Right	Left	Peds WB	Peds EB	Right	Thru	Peds NB	Peds SB	Int. Total
11:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	2	0	0	0	0	0	0	0	0	0	0	0	2
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	0	0	0	0	0	0	0	0	0	0	0	3
12:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	0	1
Grand Total	3	0	0	0	0	0	0	0	0	1	0	0	4
Apprch %	100	0	0	0	0	0	0	0	0	100	0	0	
Total %	75	0	0	0	0	0	0	0	0	25	0	0	

	Orleans-Harwich Road (Route 39) From East					Somerset Road From South					Orleans-Harwich Road (Route 39) From West					
Start Time	Thru	Left	Peds SB	Peds NB	App. Total	Right	Left	Peds WB	Peds EB	App. Total	Right	Thru	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 11:00 AM																
11:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	**2**	0	0	0	**2**	0	0	0	0	0	0	0	0	0	0	**2**
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
% App. Total	100	0	0	0		0	0	0	0		0	0	0	0		
PHF	.375	.000	.000	.000	.375	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

S: Somerset Road
E/W: Orleans-Harwich Road (Route 39)
City, State: Harwich, MA
Client: VHB/ K. Keen

File Name : 154558 CC
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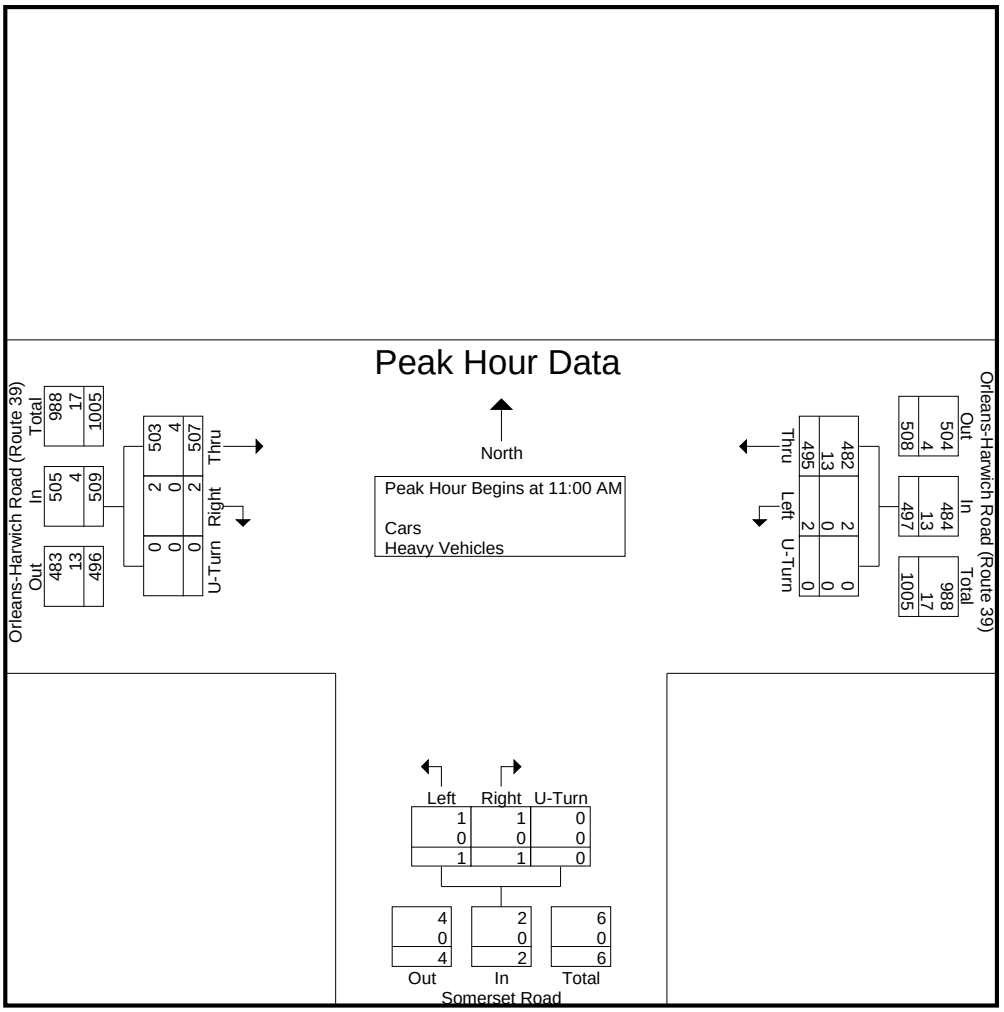
Page No : 1

	Orleans-Harwich Road (Route 39) From East				Somerset Road From South				Orleans-Harwich Road (Route 39) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:00 AM													
11:00 AM	127	0	0	127	0	0	0	0	0	**137**	0	**137**	**264**
11:15 AM	121	**1**	0	122	0	0	0	0	0	132	0	132	254
11:30 AM	**132**	1	0	**133**	**1**	**1**	0	**2**	**1**	121	0	122	257
11:45 AM	115	0	0	115	0	0	0	0	1	117	0	118	233
Total Volume	495	2	0	497	1	1	0	2	2	507	0	509	1008
% App. Total	99.6	0.4	0		50	50	0		0.4	99.6	0		
PHF	.938	.500	.000	.934	.250	.250	.000	.250	.500	.925	.000	.929	.955
Cars	482	2	0	484	1	1	0	2	2	503	0	505	991
% Cars	97.4	100	0	97.4	100	100	0	100	100	99.2	0	99.2	98.3
Heavy Vehicles	13	0	0	13	0	0	0	0	0	4	0	4	17
% Heavy Vehicles	2.6	0	0	2.6	0	0	0	0	0	0.8	0	0.8	1.7



Seasonal Adjustment Factors

CAPE COD
COMMISSION

TABLE 5: MONTHLY ADJUSTMENT FACTORS FOR CAPE COD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011*	1.26	1.25	1.20	1.06	0.96	0.89	0.76	0.76	0.92	0.99	1.08	1.14
2010	1.26	1.25	1.19	1.08	0.95	0.88	0.77	0.76	0.93	1.00	1.08	1.15
2009	1.26	1.25	1.19	1.08	0.95	0.88	0.77	0.76	0.93	1.00	1.08	1.15
2008	1.21	1.25	1.19	1.08	0.96	0.89	0.78	0.76	0.93	1.00	1.07	1.14
2007	1.25	1.21	1.17	1.06	0.96	0.86	0.78	0.79	0.93	1.00	1.08	1.14
2006	1.26	1.20	1.18	1.04	0.96	0.86	0.78	0.79	0.93	0.99	1.07	1.12
2005	1.27	1.23	1.18	1.06	0.96	0.85	0.77	0.78	0.93	0.99	1.08	1.15
2004	1.27	1.23	1.18	1.06	0.96	0.85	0.77	0.78	0.93	0.99	1.08	1.15
2003	1.29	1.23	1.16	1.06	0.99	0.87	0.79	0.77	0.95	0.99	1.07	1.14
2002	1.30	1.24	1.16	1.06	0.98	0.86	0.79	0.78	0.93	0.97	1.08	1.14
2001	1.34	1.27	1.18	1.06	0.97	0.86	0.78	0.78	0.94	0.97	1.08	1.13
2000	1.37	1.28	1.20	1.07	0.96	0.87	0.77	0.78	0.93	0.97	1.09	1.14
1999	1.37	1.29	1.23	1.09	0.96	0.87	0.76	0.77	0.94	0.99	1.10	1.15
1998	1.39	1.27	1.23	1.11	0.95	0.87	0.76	0.76	0.93	0.99	1.10	1.16
1997	1.38	1.29	1.22	1.10	0.96	0.86	0.76	0.75	0.92	0.99	1.10	1.19
1996	1.41	1.30	1.22	1.07	0.96	0.86	0.75	0.75	0.91	0.99	1.10	1.19
1995	1.36	1.33	1.24	1.07	0.97	0.86	0.75	0.75	0.90	0.99	1.10	1.19
1994	1.35	1.31	1.25	1.06	0.93	0.86	0.73	0.74	0.89	0.97	1.09	1.15
1993	1.35	1.30	1.24	1.07	0.92	0.85	0.75	0.75	0.90	0.99	1.10	1.17
1992	1.37	1.32	1.29	1.08	0.94	0.87	0.75	0.76	0.90	1.01	1.14	1.21
1991	1.39	1.30	1.22	1.08	0.94	0.87	0.76	0.77	0.95	1.02	1.12	1.20
1990	1.31	1.26	1.16	1.06	0.96	0.85	0.73	0.74	0.94	0.99	1.10	1.22
1989	1.37	1.38	1.25	1.13	0.99	0.89	0.72	0.73	0.94	1.03	1.15	1.17
1988	1.38	1.30	1.21	1.10	0.99	0.83	0.72	0.73	0.91	1.02	1.11	1.15
1987	1.40	1.39	1.23	1.10	0.94	0.85	0.71	0.73	0.96	1.02	1.18	1.25
1986	1.35	1.31	1.21	1.09	1.05	0.84	0.73	0.75	0.96	1.04	1.17	1.22
1985	1.31	1.26	1.17	1.07	0.96	0.92	0.84	0.83	0.97	0.97	1.14	1.16
1984	1.55	1.36	1.46	1.12	1.03	0.85	0.73	0.73	0.94	1.07	1.14	1.24
1983	1.53	1.51	1.30	1.15	0.98	0.82	0.65	0.66	0.87	1.07	1.23	1.30

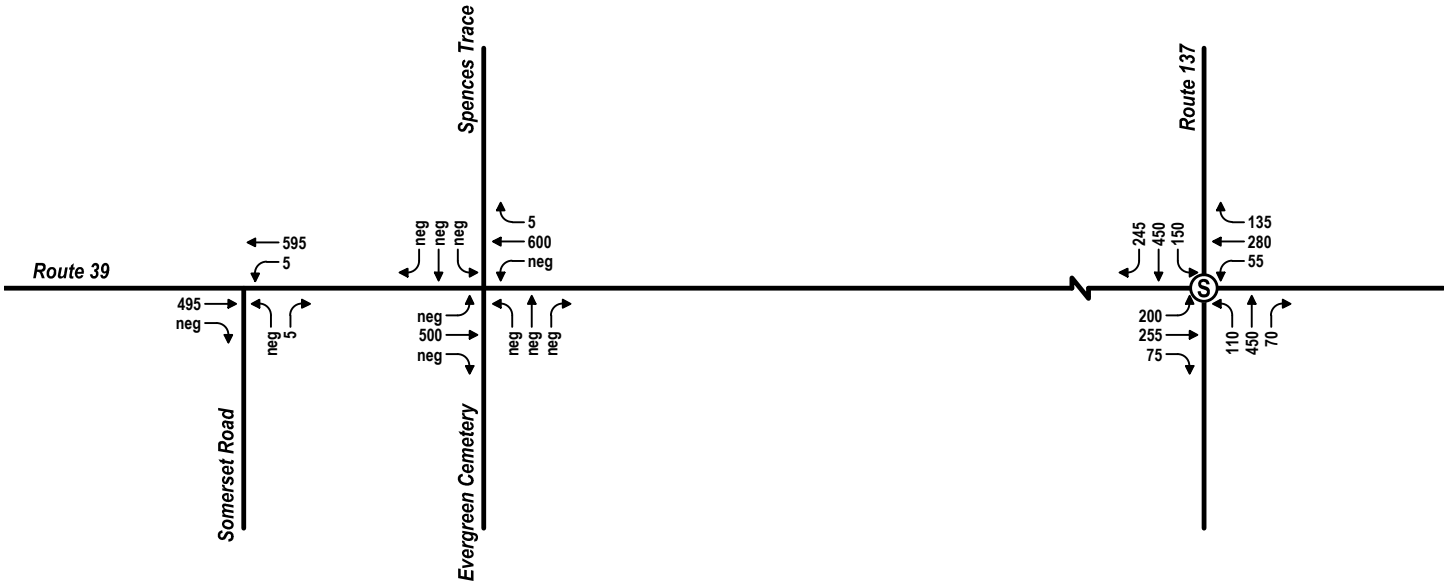
Source: Massachusetts Highway Department / Mass DOT
*2011 is the last year that MassDOT has supplied monthly adjustment factors

2015 Existing Conditions Traffic Volume Networks

WEEKDAY EVENING PEAK HOUR

Ⓢ Signalized Intersection

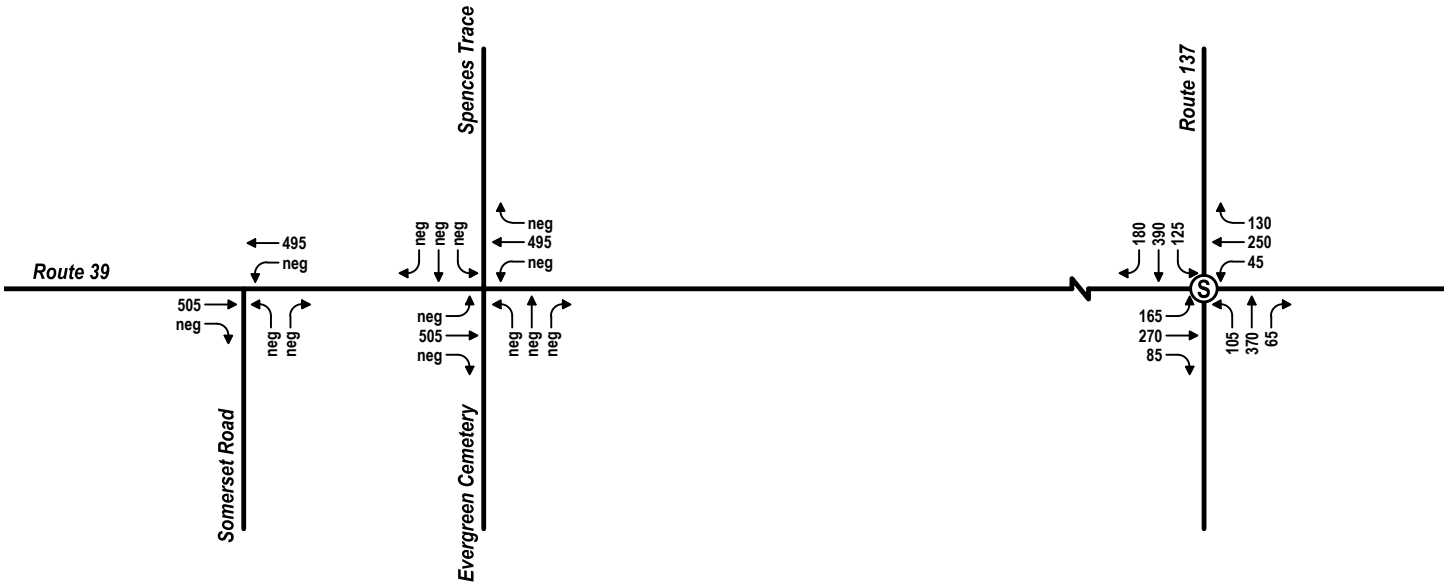
neg = Negligible



SATURDAY MIDDAY PEAK HOUR

Ⓢ Signalized Intersection

neg = Negligible



Not to Scale

2015 Existing Conditions
Peak Hour Traffic Volumes
Agway Retail Development
Harwich, Massachusetts

Vehicular Crash Data

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Harwich, MA COUNT DATE : July 2015

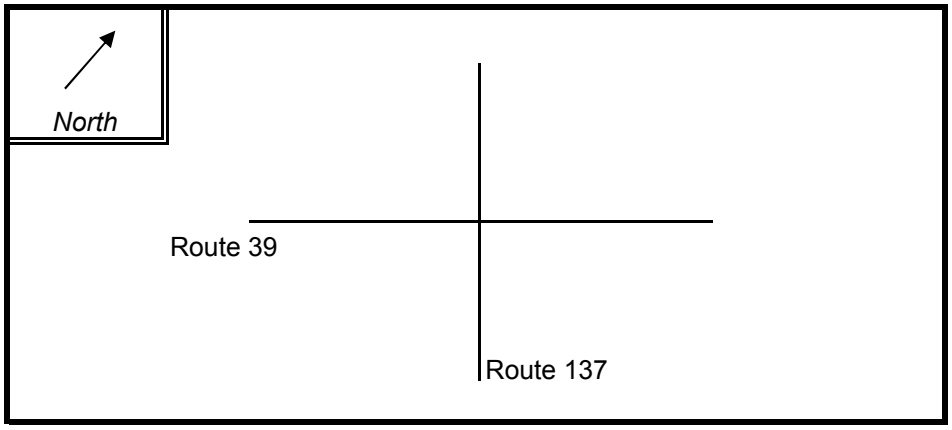
DISTRICT : 5 UNSIGNALIZED : [ ] 0.58 SIGNALIZED : [X] 0.77

~ INTERSECTION DATA ~

MAJOR STREET : Route 39

MINOR STREET(S) : Route 137

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	630	845	530	470		**2,475**

" K " FACTOR : **0.094** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **26,330**

TOTAL # OF CRASHES : 23 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **4.60**

CRASH RATE CALCULATION : **0.48** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : MassDOT Accident Data (2009-2013)

Project Title & Date: 13207.00

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Harwich, MA | COUNT DATE : July 2015

DISTRICT : 5 | UNSIGNALIZED : X (0.58) | SIGNALIZED : (0.77)

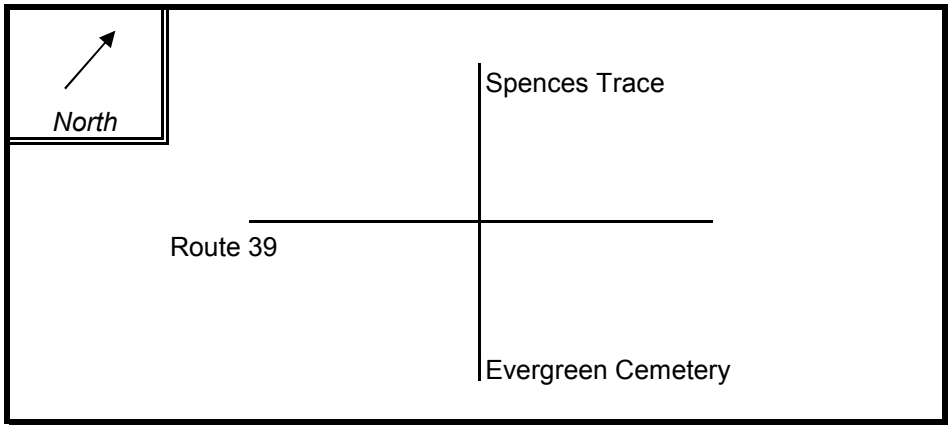
~ INTERSECTION DATA ~

MAJOR STREET : Route 39

MINOR STREET(S) : Spences Trace

Evergreen Cemetary

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	0	0	500	605		1,105

" K " FACTOR : **0.094** | INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **11,755**

TOTAL # OF CRASHES : 0 | # OF YEARS : 5 | AVERAGE # OF CRASHES PER YEAR (**A**) : **0.00**

CRASH RATE CALCULATION : **0.00** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : MassDOT Accident Data (2009-2013)

Project Title & Date: 13207.00

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Harwich, MA | COUNT DATE : July 2015

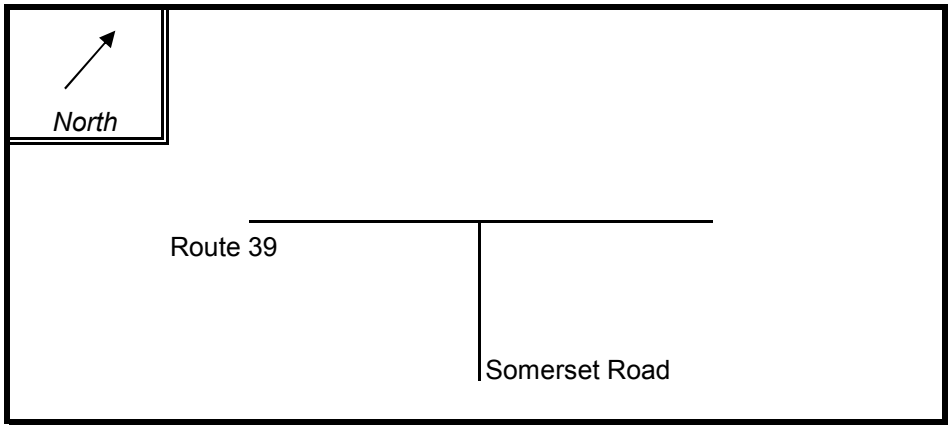
DISTRICT : 5 | UNSIGNALIZED : X (0.58) | SIGNALIZED : (0.77)

~ INTERSECTION DATA ~

MAJOR STREET : Route 39

MINOR STREET(S) : Somserset Road

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	5		495	600		**1,100**

" K " FACTOR : **0.094** | INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **11,702**

TOTAL # OF CRASHES : 0 | # OF YEARS : 5 | AVERAGE # OF CRASHES PER YEAR (**A**) : **0.00**

CRASH RATE CALCULATION : **0.00** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : MassDOT Accident Data (2009-2013)

Project Title & Date: 13207.00

Crash ID	Town	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Street	Intersection	Distance From Nearest Intersection	Vehicles Travel Directions	Most Harmful Events	Distance from Nearest Landmark	Vehicle Action Prior to Crash	Vehicle Configuration
Route 39 at Route 137																			
2558657	HARWICH	12/25/2009	8:51 PM	Non-fatal injury	2	1	0	Head-on	Wet	Dark - lighted roadway	Clear	ORLEANS HARWICH ROAD Rte 39 N / ROUTE 137 Rte 137 N	ORLEANS HARWICH ROAD Rte 39 N / ROUTE 137 Rte 137 N		V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Turning left / V2:Travelling straight ahead	V1: Passenger car / V2:Passenger car
2449511	HARWICH	3/21/2009	2:14 PM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear			ORLEANS HARWICH ROAD Rte 39 / Rte 137	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	STOP AND SHOP	V1: Travelling straight ahead / V2:Turning left	V1: Passenger car / V2:Passenger car
2448946	HARWICH	3/21/2009	2:23 PM	Non-fatal injury	2	2	0	Rear-end	Dry	Daylight	Clear	Rte 137 / ORLEANS HARWICH ROAD	Rte 137 / ORLEANS HARWICH ROAD		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1: Passenger car / V2:Passenger car
2452434	HARWICH	4/5/2009	1:40 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	Rte 137 / ORLEANS HARWICH ROAD	Rte 137 / ORLEANS HARWICH ROAD		V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Travelling straight ahead / V2:Travelling straight ahead	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2469358	HARWICH	5/16/2009	11:44 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear			129 ROUTE 137 Rte 137 N	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Travelling straight ahead / V2:Entering traffic lane	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2486694	HARWICH	6/23/2009	11:49 AM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Rain			1420 ORLEANS HARWICH ROAD Rte 137 S / Rte 137	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	HINKLEYS HOME CENTER	V1: Travelling straight ahead / V2:Turning right	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2489059	HARWICH	7/4/2009	11:07 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	ROUTE 137 Rte 137 S / ORLEANS HARWICH ROAD Rte 39 N	ROUTE 137 Rte 137 S / ORLEANS HARWICH ROAD Rte 39 N		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2498706	HARWICH	7/25/2009	10:19 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	ORLEANS HARWICH ROAD / Rte 137	ORLEANS HARWICH ROAD / Rte 137		V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Travelling straight ahead / V2:Travelling straight ahead	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2502086	HARWICH	8/6/2009	2:53 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	Rte 137 / Rte 39	Rte 137 / Rte 39		V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Travelling straight ahead / V2:Entering traffic lane	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2553383	HARWICH	11/28/2009	4:25 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dusk	Clear	ORLEANS HARWICH ROAD Rte 39 N / ROUTE 137 Rte 137 S	ORLEANS HARWICH ROAD Rte 39 N / ROUTE 137 Rte 137 S		V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	EAST HARWICH PLAZA	V1: Turning right / V2:Travelling straight ahead	V1: Passenger car / V2:Passenger car
2624161	HARWICH	7/26/2010	4:26 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	ORLEANS HARWICH ROAD / Rte 137	ORLEANS HARWICH ROAD / Rte 137		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1: Passenger car / V2:Passenger car
2726725	HARWICH	5/20/2011	4:46 PM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Daylight	Clear	Rte 137 N / ORLEANS HARWICH ROAD Rte 39 N	Rte 137 N / ORLEANS HARWICH ROAD Rte 39 N		V1:Northbound	V1: Overturn/rollover		V1: Travelling straight ahead	V1: Motorcycle
2783191	HARWICH	10/8/2011	2:55 PM	Non-fatal injury	2	1	0	Rear-end	Dry	Daylight	Clear	ROUTE 137 Rte 137 N / ORLEANS HARWICH ROAD Rte 39 N	ROUTE 137 Rte 137 N / ORLEANS HARWICH ROAD Rte 39 N		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	STOP & SHOP	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1: Other / V2:Passenger car
2881834	HARWICH	12/30/2011	12:29 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear			ORLEANS ROAD / Rte 137	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Travelling straight ahead / V2:Travelling straight ahead	V1: Passenger car / V2:Passenger car
3098540	HARWICH	5/4/2012	4:35 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Cloudy/Rain			ORLEANS HARWICH ROAD Rte 137 / Rte 137	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Travelling straight ahead / V2:Travelling straight ahead	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
3228292	HARWICH	6/6/2012	6:48 AM	Non-fatal injury	2	1	0	Rear-end	Dry	Daylight	Clear	Rte 137 / Rte 39	Rte 137 / Rte 39		V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1: Motorcycle / V2:Passenger car
3282059	HARWICH	9/14/2012	1:46 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	Rte 137 / ORLEANS HARWICH ROAD	Rte 137 / ORLEANS HARWICH ROAD		V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Turning left / V2:Turning left	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
3284479	HARWICH	9/17/2012	12:14 PM	Non-fatal injury	2	1	0	Rear-end	Dry	Daylight	Clear	ORLEANS HARWICH ROAD / Rte 137	ORLEANS HARWICH ROAD / Rte 137		V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1: Passenger car / V2:Motorcycle
3289190	HARWICH	9/23/2012	11:35 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	Rte 137 / ORLEANS HARWICH ROAD	Rte 137 / ORLEANS HARWICH ROAD		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1: Passenger car / V2:Passenger car
3346830	HARWICH	11/28/2012	9:59 AM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Dry	Daylight	Cloudy	ORLEANS HARWICH ROAD / Rte 137	ORLEANS HARWICH ROAD / Rte 137		V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Turning right / V2:Turning left	V1: Passenger car / V2:Passenger car
3368745	HARWICH	1/24/2013	5:12 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Dark - lighted roadway	Clear			ORLEANS HARWICH ROAD Rte 39 E / Rte 137	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1: Passenger car / V2:Passenger car
3394638	HARWICH	3/22/2013	6:32 AM	Non-fatal injury	2	1	0	Angle	Snow	Daylight	Snow/Blowing sand, snow			129 ROUTE 137 Rte 137 N / CONTINENTAL DRIVE	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Travelling straight ahead / V2:Travelling straight ahead	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
3700178	HARWICH	11/13/2013	11:55 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear			ORLEANS HARWICH ROAD / Rte 137	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic		V1: Entering traffic lane / V2:Turning left	V1: Passenger car / V2:Passenger car

Historic Traffic Growth

CAPE COD COMMISSION

7.3. CAPE-WIDE TRAFFIC

The ten-year period between 2003 and 2013 was the fifth consecutive ten-year period of negative growth. Each ten-year period prior to the 1998-2008 decade experienced positive growth. 1994 was the first year the Cape Cod Commission's Traffic Counting Program had sufficient data to run a ten-year analysis (since the program began in 1984), and this period had almost 15% growth. As the following chart shows, even though the percent change for the sets of 10-year periods ending after 2002 had been decreasing, it was still a positive change. Between 2002 and 2007, traffic volume changes during overlapping 10-year periods have been increasing, albeit at a slower pace each year.

In 2009, we see the most severe 10-year drop in traffic volumes since the CCC has been keeping track of the statistic (-9.05%). While one may be tempted to assume this means traffic has decreased in 2009 since 2008, it is important to remember that the 10-year period ending in 2008 includes comparisons beginning with 1998 – a year that had significantly lower traffic volumes than the year 1999. 1999 volumes are included in the 10-

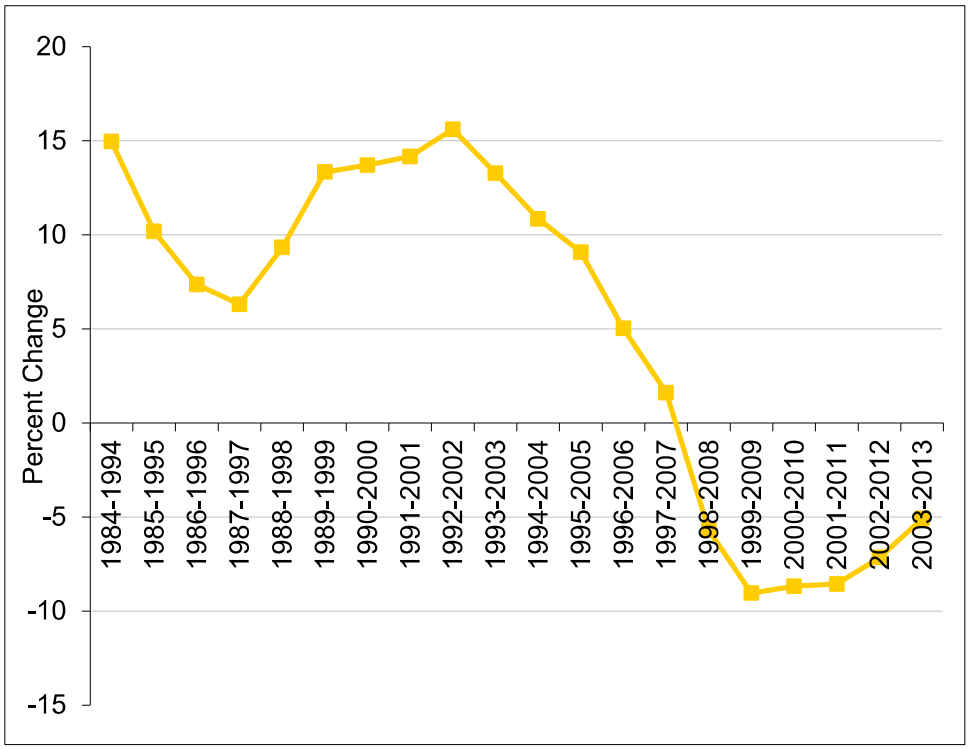


FIGURE 7: PERCENTAGE CHANGE FOR 10-YEAR PERIODS

year analysis for 1999-2009, and contribute to the 10-year decline for the period. Cape-wide traffic actually increased from 2008 to 2009 by 4.51%.

This same pattern continues in 2013, where the ten-year period from 2003-2013 shows 5.08% decline.

The following table shows the growth rates for various sub-regions and roads of Cape Cod over a 10-year period. The average annual growth rate between 2003 and 2013 is -0.52% for all of Cape Cod. From 2003 to 2013 all regions experienced traffic declines with the greatest declines observed on the Outer Cape, followed by the Mid- and Lower Cape, with the most modest decline seen on the Upper Cape. The 2012-2013 comparison however suggest that this trend may be reversing with traffic growth observed in the Lower Cape and traffic decline in the other Cape regions.

TABLE 8: CAPE COD SUMMER TRAFFIC GROWTH BY SUBREGION

Region*	Number of Comparisons**	10-Year Total Growth	10-Year Annual Average Growth Rate	One-Year Growth Rate 2012-2013
Upper Cape	110	-0.55%	-0.06%	-0.55%
Mid-Cape	110	-8.30%	-0.87%	-4.80%
Lower Cape	72	-7.90%	-0.82%	5.43%
Outer Cape	65	-10.56%	-1.11%	-6.02%
All Roads	**357**	**-5.08%**	**-0.52%**	**-1.04%**

*Upper = Bourne, Sandwich, Falmouth, Mashpee | Mid = Barnstable, Yarmouth, Dennis
Lower = Harwich, Chatham, Brewster, Orleans | Outer = Eastham, Wellfleet, Truro, Provincetown

** Corresponds to ten-year analysis only

In regards to the traffic volume change from 2003 to 2013, it is unclear what is responsible for the notable decrease. The Cape-wide population has shown only a moderate decline during a portion this time period (see following table), and conventional trip generators (commercial establishments, residences, etc.) have not been reduced.

CAPE COD COMMISSION

TABLE 9: BARNSTABLE COUNTY POPULATION ESTIMATE

	1990	2000	2010	% Change 2000-2010
Population	186,605	222,230	215,888	-2.85%

Source: U.S. Census Bureau, Census 2010, Census 2000, Census 1990

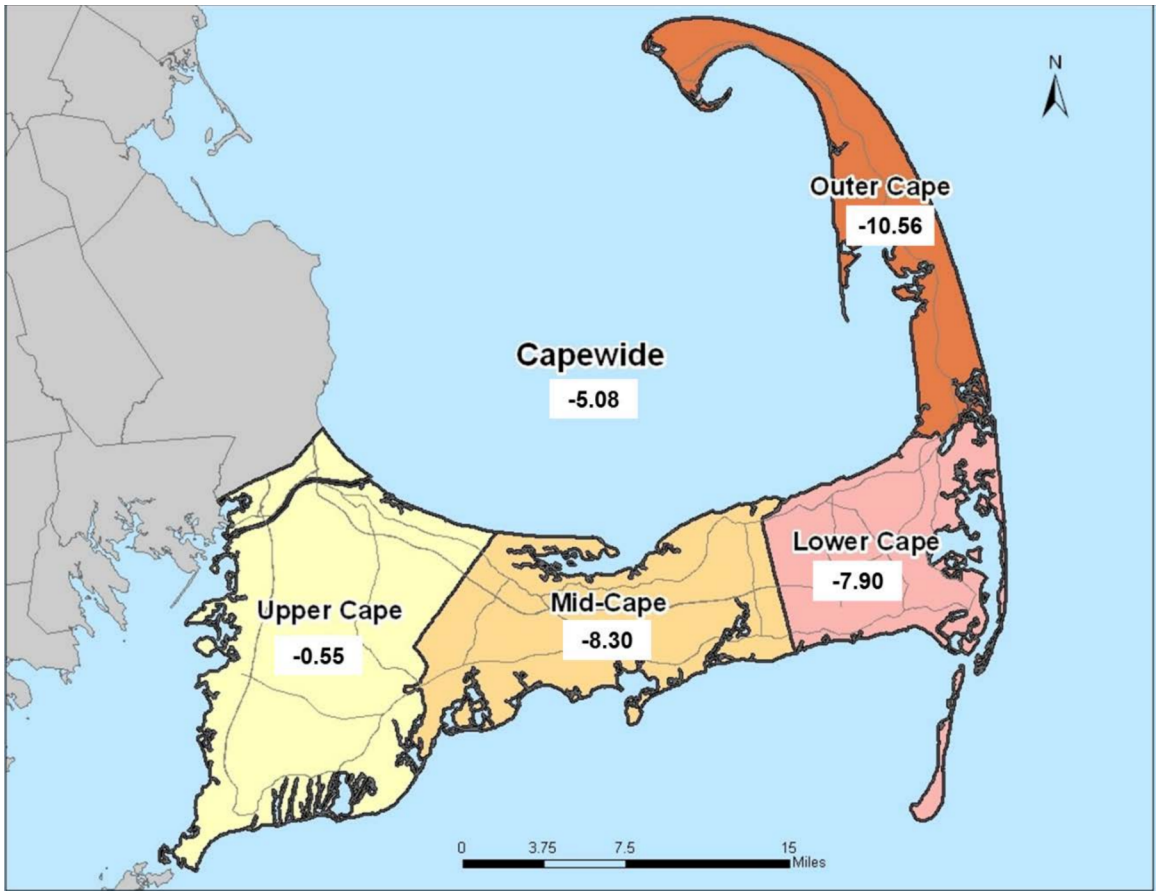


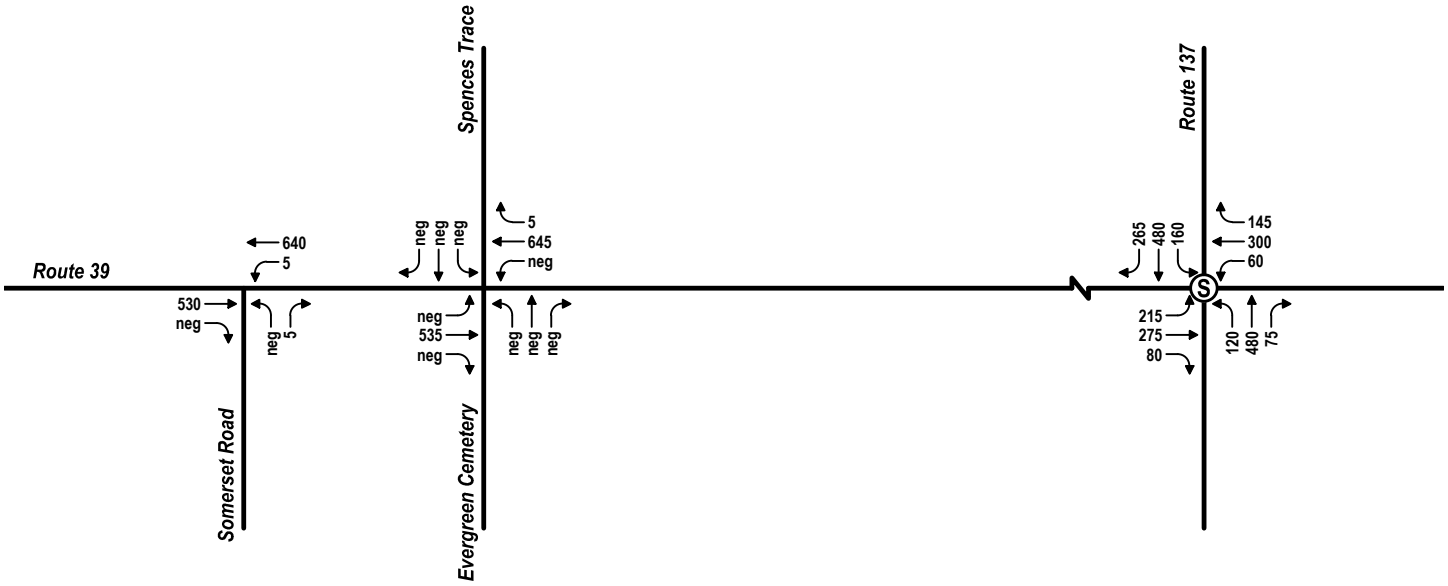
FIGURE 8: SUBREGION 10-YEAR AVERAGE ANNUAL GROWTH RATE (%)

2022 No-Build Conditions Traffic Volume Networks

WEEKDAY EVENING PEAK HOUR

Ⓢ Signalized Intersection

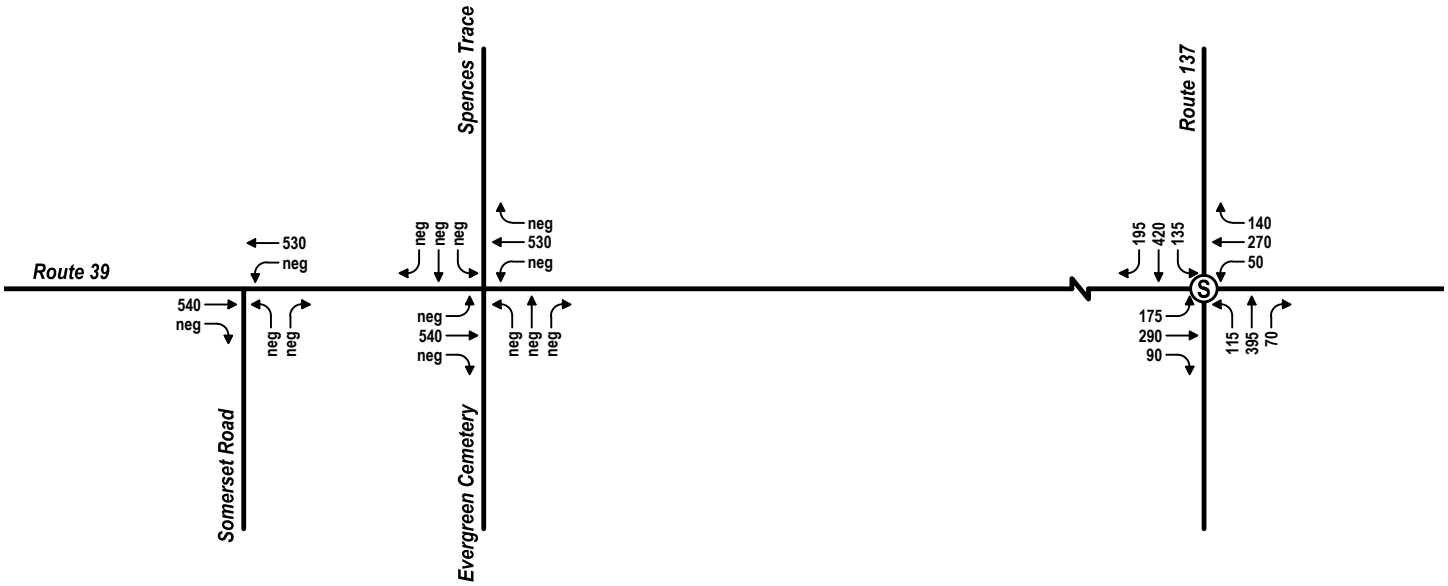
neg = Negligible



SATURDAY MIDDAY PEAK HOUR

Ⓢ Signalized Intersection

neg = Negligible



Not to Scale

2022 No-Build Conditions
Peak Hour Traffic Volumes
Agway Retail Development
Harwich, Massachusetts

Trip Generation

ITE TRIP GENERATION WORKSHEET
(9th Edition, Updated 2012)

LANDUSE: Specialty Retail Center
LANDUSE CODE: 826 Independent Variable --- 1,000 Sq. Feet Gross Floor Area

JOB NAME: **Agway Retail Development** **FLOOR AREA (KSF):** 38.288
JOB NUMBER: **13207.00**

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Total Trip Ends Low	Total Trip Ends High	Independent Variable Range Average	Independent Variable Range Low	Independent Variable Range High	Directional Distribution Enter	Directional Distribution Exit
DAILY	4	0.69	44.32	21.30	64.21	25	15	43	50%	50%
AM PEAK (ADJACENT ST)	4	0.90	6.84	5.33	14.08	60	15	150	48%	52%
PM PEAK (ADJACENT ST)	3	--	5.02	4.59	6.18	75	15	150	56%	44%

TRIPS:

	BY AVERAGE Total	BY AVERAGE Enter	BY AVERAGE Exit	BY REGRESSION Total	BY REGRESSION Enter	BY REGRESSION Exit
DAILY	1,697	848	848	1676	838	838
AM PEAK OF GENERATOR	262	126	136	304	146	158
PM PEAK OF GENERATOR	192	108	85	NA	NA	NA

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Total Trip Ends Low	Total Trip Ends High	Independent Variable Range Average	Independent Variable Range Low	Independent Variable Range High	Directional Distribution Enter	Directional Distribution Exit
DAILY	3	--	42.04	22.57	54.47	28	17	44	50%	50%
PEAK OF GENERATOR	--	--	--	--	--	--	--	--	--	--

TRIPS:

	BY AVERAGE Total	BY AVERAGE Enter	BY AVERAGE Exit	BY REGRESSION Total	BY REGRESSION Enter	BY REGRESSION Exit
DAILY	1,610	805	805	NA	NA	NA
PEAK OF GENERATOR	NA	NA	NA	NA	NA	NA

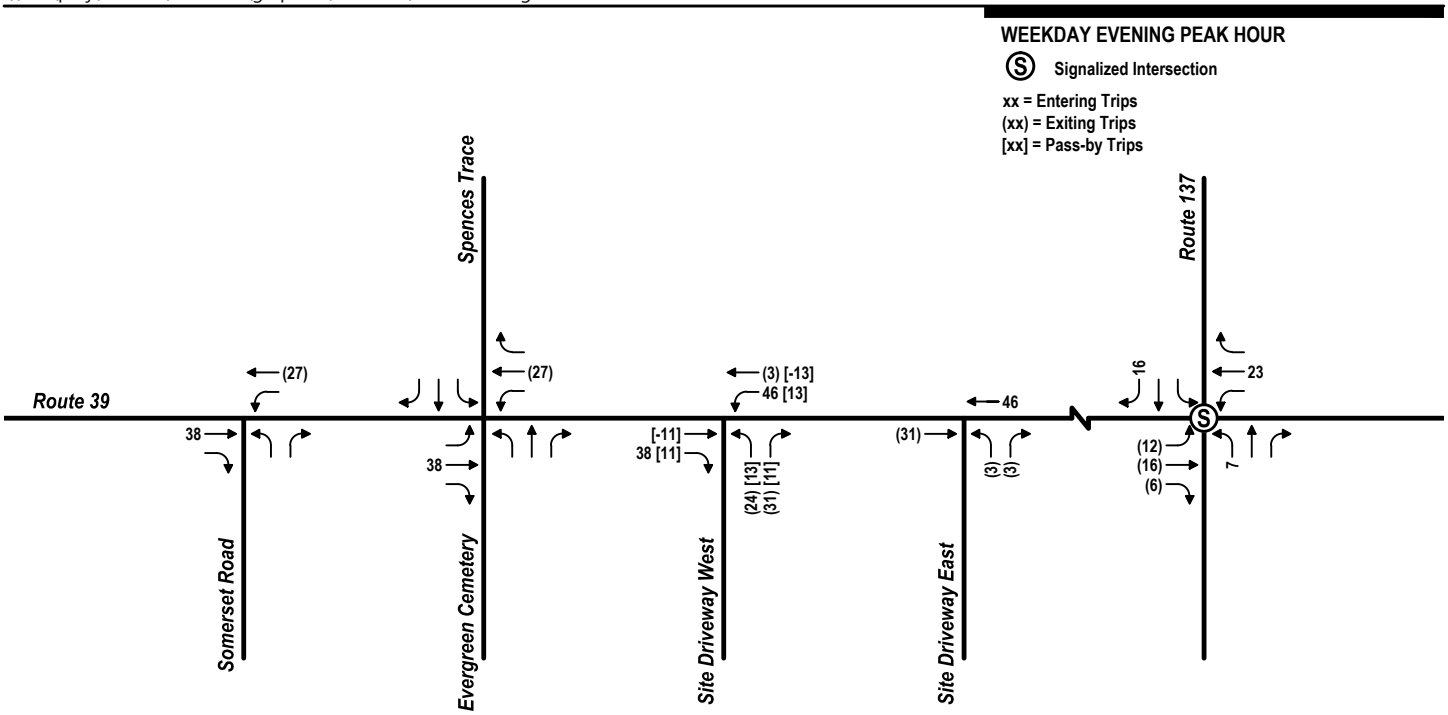
SUNDAY

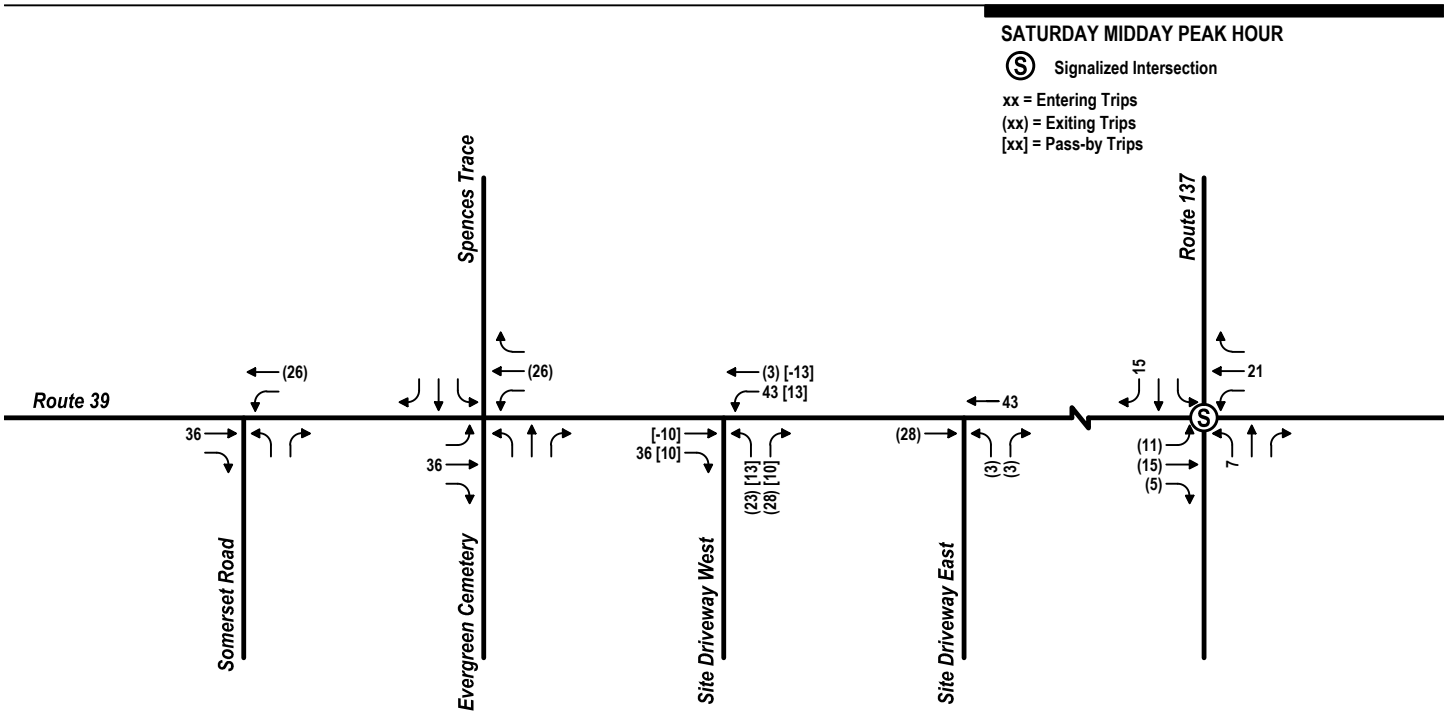
RATES:

	# Studies	R^2	Total Trip Ends Average	Total Trip Ends Low	Total Trip Ends High	Independent Variable Range Average	Independent Variable Range Low	Independent Variable Range High	Directional Distribution Enter	Directional Distribution Exit
DAILY	3	--	20.43	6.96	32.82	28	17	43	50%	50%
PEAK OF GENERATOR	--	--	--	--	--	--	--	--	--	--

TRIPS:

	BY AVERAGE Total	BY AVERAGE Enter	BY AVERAGE Exit	BY REGRESSION Total	BY REGRESSION Enter	BY REGRESSION Exit
DAILY	782	391	391	NA	NA	NA
PEAK OF GENERATOR	NA	NA	NA	NA	NA	NA



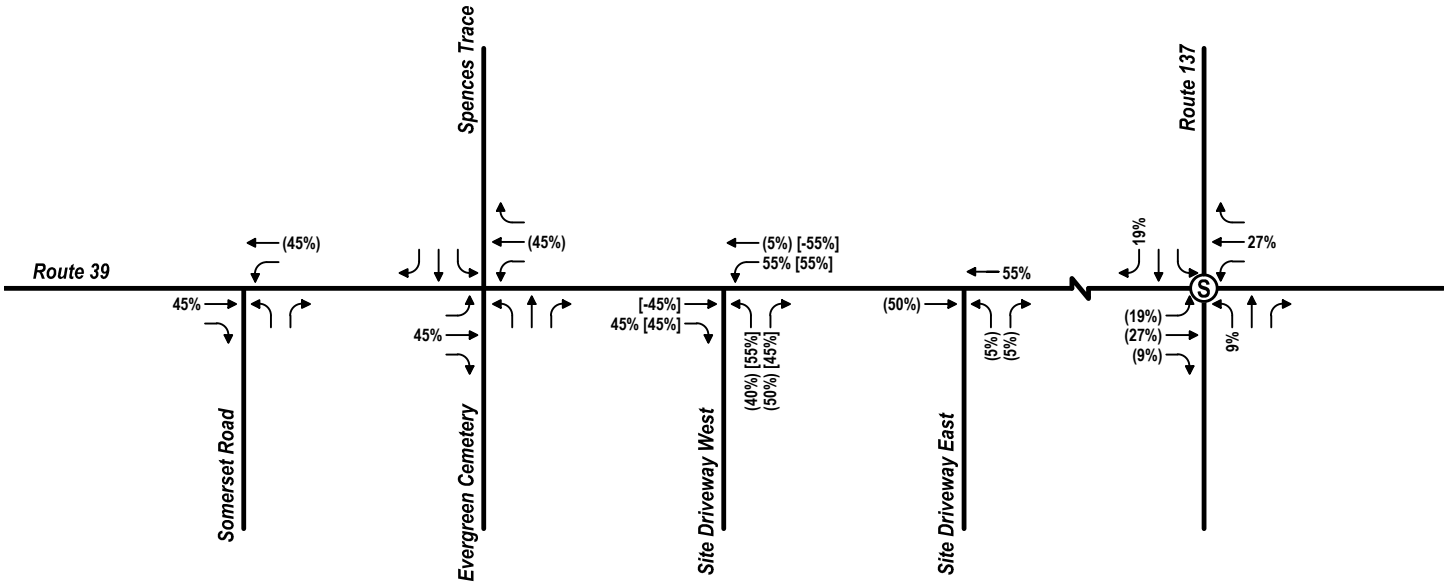


Not to Scale

Site-Generated Trips
Peak Hour Traffic Volumes
Agway Retail Development
Harwich, Massachusetts

Trip Distribution

Ⓢ Signalized Intersection
xx% = Entering Trips
(xx%) = Exiting Trips
[xx%] = Pass-by Trips



Not to Scale

Trip Distribution

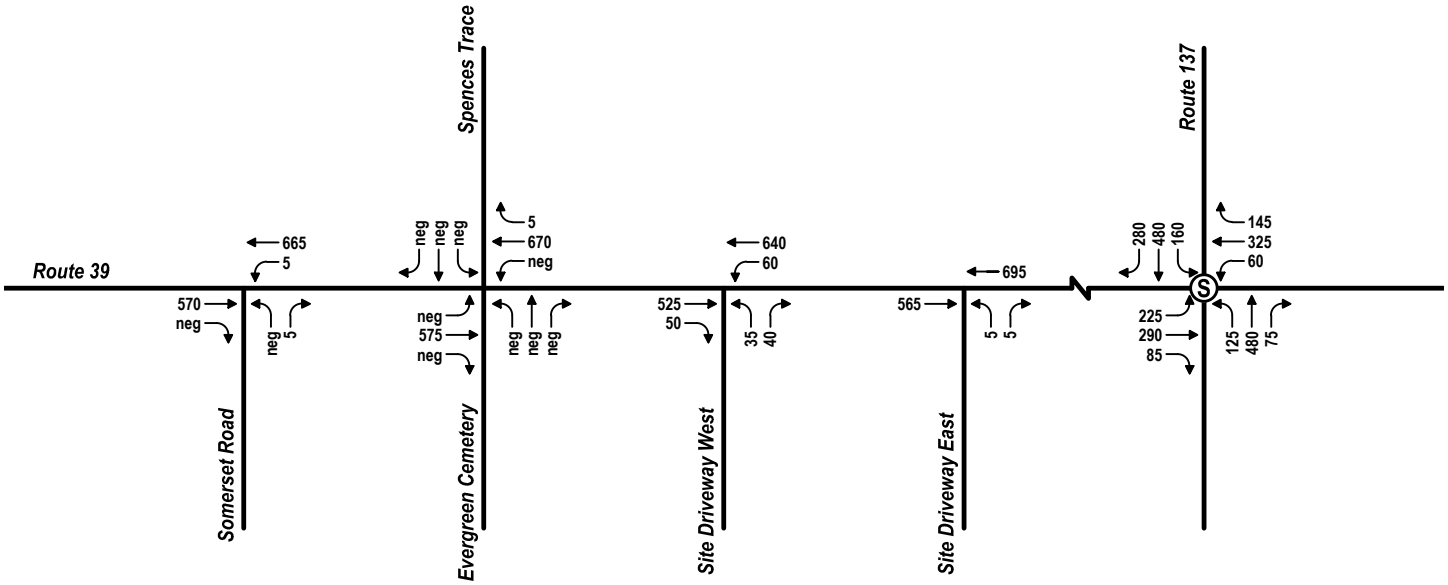
Agway Retail Development
Harwich, Massachusetts

2022 Build Conditions Traffic Volume Networks

WEEKDAY EVENING PEAK HOUR

Ⓢ Signalized Intersection

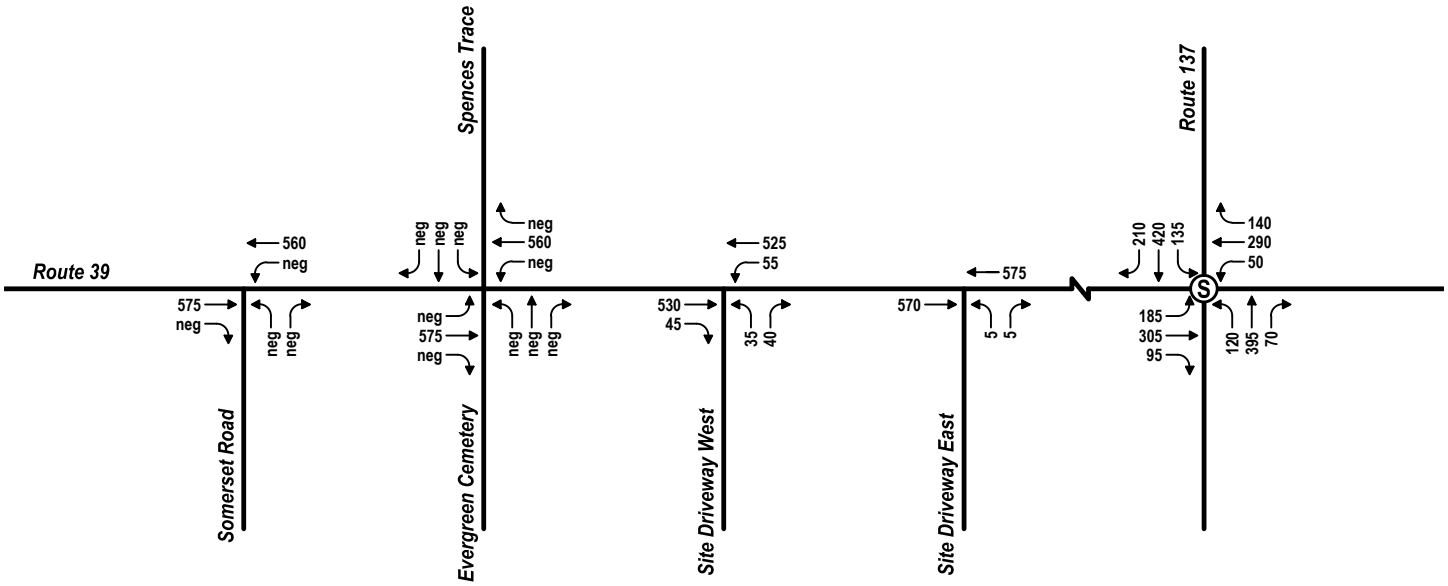
neg = Negligible



SATURDAY MIDDAY PEAK HOUR

Ⓢ Signalized Intersection

neg = Negligible



Not to Scale

2022 Build Conditions
Peak Hour Traffic Volumes
Agway Retail Development
Harwich, Massachusetts

Intersection Capacity Analyses

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	255	75	55	280	135	110	450	70	150	450	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		70	115		70	210		55	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	1863	1583	1752	1845	1568	1770	1863	1583	1787	1881	1599
Flt Permitted	0.950			0.950			0.216			0.480		
Satd. Flow (perm)	1770	1863	1583	1746	1845	1568	402	1863	1583	903	1881	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			150			95			212
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1063			470			723			426	
Travel Time (s)		24.2			10.7			16.4			9.7	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	222	283	83	59	298	144	122	500	78	155	464	253
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	7	1	6		7	4			8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2 7	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	6.0	10.0	6.0	6.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	15.0	10.0	11.0	15.0	15.0	10.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	12.0	35.0	11.0	12.0	35.0	35.0	11.0	33.0	33.0	22.0	22.0	22.0
Total Split (%)	15.0%	43.8%	13.8%	15.0%	43.8%	43.8%	13.8%	41.3%	41.3%	27.5%	27.5%	27.5%
Yellow Time (s)	3.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	9.9	25.3	38.9	6.6	17.6	17.6	38.5	37.5	37.5	26.9	26.9	26.9
Actuated g/C Ratio	0.12	0.32	0.49	0.08	0.22	0.22	0.48	0.47	0.47	0.34	0.34	0.34
v/c Ratio	1.02	0.48	0.10	0.41	0.73	0.31	0.36	0.57	0.10	0.51	0.73	0.37
Control Delay	109.1	26.9	2.6	43.6	39.4	5.7	15.1	19.0	2.8	32.5	34.8	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.1	26.9	2.6	43.6	39.4	5.7	15.1	19.0	2.8	32.5	34.8	7.6
LOS	F	C	A	D	D	A	B	B	A	C	C	A
Approach Delay		54.5			30.2			16.5			26.5	
Approach LOS		D			C			B			C	
Queue Length 50th (ft)	~153	131	0	28	140	0	30	159	0	60	198	14
Queue Length 95th (ft)	#285	187	17	65	197	36	69	297	19	#168	#438	77
Internal Link Dist (ft)		983			390			643			346	
Turn Bay Length (ft)	95		70	115		70	210		55	160		145
Base Capacity (vph)	217	724	813	153	691	681	344	873	792	303	632	678
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.39	0.10	0.39	0.43	0.21	0.35	0.57	0.10	0.51	0.73	0.37

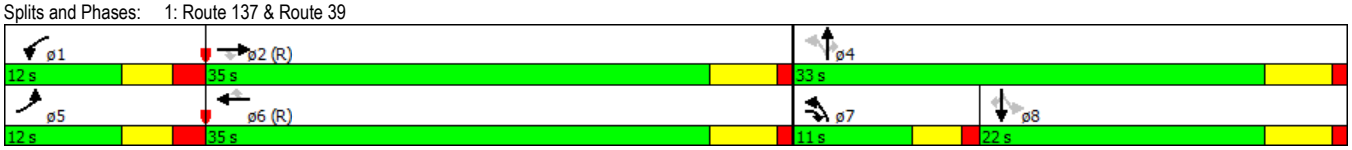
Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 30.8 Intersection LOS: C
Intersection Capacity Utilization 74.5% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 137 & Route 39



Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	500	0	2	600	5	1	0	0	1	0	0
Conflicting Peds, #/hr	0	0	3	3	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	93	93	93	25	25	25	25	25	25
Heavy Vehicles, %	2	2	2	4	4	4	0	0	0	0	0	0
Mvmt Flow	0	556	0	2	645	5	4	0	0	4	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	651	0	0	556	0	0	1208	1211	559	1208	1208	651
Stage 1	-	-	-	-	-	-	556	556	-	652	652	-
Stage 2	-	-	-	-	-	-	652	655	-	556	556	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.236	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	935	-	-	1005	-	-	161	184	532	161	185	472
Stage 1	-	-	-	-	-	-	519	516	-	460	467	-
Stage 2	-	-	-	-	-	-	460	466	-	519	516	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	933	-	-	1002	-	-	160	183	531	160	184	471
Mov Cap-2 Maneuver	-	-	-	-	-	-	160	183	-	160	184	-
Stage 1	-	-	-	-	-	-	519	516	-	460	466	-
Stage 2	-	-	-	-	-	-	457	465	-	518	516	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	28.1	28.1
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	160	933	-	-	1002	-	-	160
HCM Lane V/C Ratio	0.025	-	-	-	0.002	-	-	0.025
HCM Control Delay (s)	28.1	0	-	-	8.6	0	-	28.1
HCM Lane LOS	D	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	495	1	5	595	1	5
Conflicting Peds, #/hr	0	3	3	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	95	95	50	50
Heavy Vehicles, %	2	2	4	4	0	0
Mvmt Flow	544	1	5	626	2	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	546	0	1183	549
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	637	-
Critical Hdwy	-	-	4.14	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.236	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1013	-	211	539
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	531	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1010	-	209	537
Mov Cap-2 Maneuver	-	-	-	-	209	-
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	525	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	426	-	-	1010	-
HCM Lane V/C Ratio	0.028	-	-	0.005	-
HCM Control Delay (s)	13.7	-	-	8.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

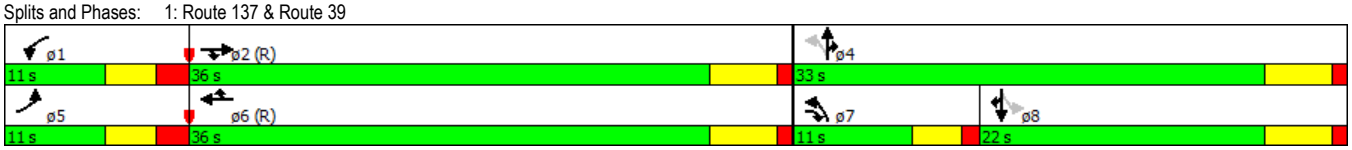
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	270	85	45	250	130	105	370	65	125	390	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		70	115		70	210		55	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1787	1881	1599	1736	1827	1553	1770	1863	1583	1752	1845	1568
Flt Permitted	0.950			0.950			0.231			0.526		
Satd. Flow (perm)	1787	1881	1599	1736	1827	1553	430	1863	1583	970	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			97			150			95			179
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1063			470			723			426	
Travel Time (s)		24.2			10.7			16.4			9.7	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	188	307	97	49	275	143	114	402	71	137	429	198
Turn Type	Prot	NA	pt+ov	Prot	NA	Prot	pm+pt	NA	Prot	Perm	NA	Prot
Protected Phases	5	2	2 7	1	6	6	7	4	4		8	8
Permitted Phases							4			8		
Detector Phase	5	2	2 7	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	15.0		11.0	15.0	15.0	10.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	11.0	36.0		11.0	36.0	36.0	11.0	33.0	33.0	22.0	22.0	22.0
Total Split (%)	13.8%	45.0%		13.8%	45.0%	45.0%	13.8%	41.3%	41.3%	27.5%	27.5%	27.5%
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0		2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	9.6	25.2	38.0	6.1	17.3	17.3	39.1	38.1	38.1	25.3	25.3	25.3
Actuated g/C Ratio	0.12	0.32	0.48	0.08	0.22	0.22	0.49	0.48	0.48	0.32	0.32	0.32
v/c Ratio	0.88	0.52	0.12	0.37	0.70	0.31	0.32	0.45	0.09	0.45	0.74	0.32
Control Delay	79.1	27.4	3.1	43.4	37.6	5.7	14.3	16.5	2.2	29.7	35.7	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.1	27.4	3.1	43.4	37.6	5.7	14.3	16.5	2.2	29.7	35.7	6.8
LOS	E	C	A	D	D	A	B	B	A	C	D	A
Approach Delay		39.8			28.4			14.4			27.1	
Approach LOS		D			C			B			C	
Queue Length 50th (ft)	~108	142	0	24	127	0	28	122	0	52	182	6
Queue Length 95th (ft)	#244	196	21	57	182	36	64	223	15	#133	#399	59
Internal Link Dist (ft)		983			390			643			346	
Turn Bay Length (ft)	95		70	115		70	210		55	160		145
Base Capacity (vph)	214	729	813	133	707	693	360	886	803	306	583	618
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.42	0.12	0.37	0.39	0.21	0.32	0.45	0.09	0.45	0.74	0.32

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 27.4		Intersection LOS: C	
Intersection Capacity Utilization 65.4%		ICU Level of Service C	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 137 & Route 39



Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	505	0	0	495	2	1	0	0	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	25	25	25	38	38	38
Heavy Vehicles, %	1	1	1	3	3	3	0	0	0	0	0	0
Mvmt Flow	1	543	0	0	532	2	4	0	0	5	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	534	0	0	543	0	0	1080	1079	543	1078	1078	533
Stage 1	-	-	-	-	-	-	545	545	-	533	533	-
Stage 2	-	-	-	-	-	-	535	534	-	545	545	-
Critical Hdwy	4.11	-	-	4.13	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.227	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1039	-	-	1021	-	-	197	220	544	198	220	551
Stage 1	-	-	-	-	-	-	526	522	-	534	528	-
Stage 2	-	-	-	-	-	-	533	528	-	526	522	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1039	-	-	1021	-	-	196	220	544	198	220	551
Mov Cap-2 Maneuver	-	-	-	-	-	-	196	220	-	198	220	-
Stage 1	-	-	-	-	-	-	525	521	-	533	528	-
Stage 2	-	-	-	-	-	-	530	528	-	525	521	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	23.8	19.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	196	1039	-	-	1021	-	-	252
HCM Lane V/C Ratio	0.02	0.001	-	-	-	-	-	0.031
HCM Control Delay (s)	23.8	8.5	0	-	0	-	-	19.7
HCM Lane LOS	C	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	505	2	2	495	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	25	25
Heavy Vehicles, %	1	1	3	3	0	0
Mvmt Flow	543	2	2	532	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	545	0	1081	544
Stage 1	-	-	-	-	544	-
Stage 2	-	-	-	-	537	-
Critical Hdwy	-	-	4.13	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.227	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1019	-	243	543
Stage 1	-	-	-	-	586	-
Stage 2	-	-	-	-	590	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1019	-	242	543
Mov Cap-2 Maneuver	-	-	-	-	242	-
Stage 1	-	-	-	-	586	-
Stage 2	-	-	-	-	588	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	335	-	-	1019	-
HCM Lane V/C Ratio	0.024	-	-	0.002	-
HCM Control Delay (s)	16	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	215	275	80	60	300	145	120	480	75	160	480	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		70	115		70	210		55	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	1863	1583	1752	1845	1568	1770	1863	1583	1787	1881	1599
Flt Permitted	0.950			0.950			0.177			0.466		
Satd. Flow (perm)	1770	1863	1583	1746	1845	1568	330	1863	1583	877	1881	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			150			95			214
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1063			470			723			426	
Travel Time (s)		24.2			10.7			16.4			9.7	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	239	306	89	64	319	154	133	533	83	165	495	273
Turn Type	Prot	NA	pt+ov	Prot	NA	Prot	pm+pt	NA	Prot	Perm	NA	Prot
Protected Phases	5	2	2 7	1	6	6	7	4	4		8	8
Permitted Phases							4			8		
Detector Phase	5	2	2 7	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	15.0		11.0	15.0	15.0	10.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	12.0	35.0		12.0	35.0	35.0	11.0	33.0	33.0	22.0	22.0	22.0
Total Split (%)	15.0%	43.8%		15.0%	43.8%	43.8%	13.8%	41.3%	41.3%	27.5%	27.5%	27.5%
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0		2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	7.0	21.3	34.1	6.6	18.7	18.7	40.3	39.3	39.3	26.5	26.5	26.5
Actuated g/C Ratio	0.09	0.27	0.43	0.08	0.23	0.23	0.50	0.49	0.49	0.33	0.33	0.33
v/c Ratio	1.55	0.62	0.12	0.44	0.74	0.32	0.41	0.58	0.10	0.57	0.80	0.41
Control Delay	307.2	31.7	2.8	44.9	38.3	6.1	16.3	19.3	3.2	36.3	39.5	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	307.2	31.7	2.8	44.9	38.3	6.1	16.3	19.3	3.2	36.3	39.5	8.9
LOS	F	C	A	D	D	A	B	B	A	D	D	A
Approach Delay		131.5			29.9			17.0			30.0	
Approach LOS		F			C			B			C	
Queue Length 50th (ft)	~171	141	0	31	149	2	34	179	0	67	222	20
Queue Length 95th (ft)	#308	198	19	69	208	40	76	333	22	#193	#493	92
Internal Link Dist (ft)		983			390			643			346	
Turn Bay Length (ft)	95		70	115		70	210		55	160		145
Base Capacity (vph)	154	698	735	153	691	681	328	914	825	290	622	672
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.55	0.44	0.12	0.42	0.46	0.23	0.41	0.58	0.10	0.57	0.80	0.41

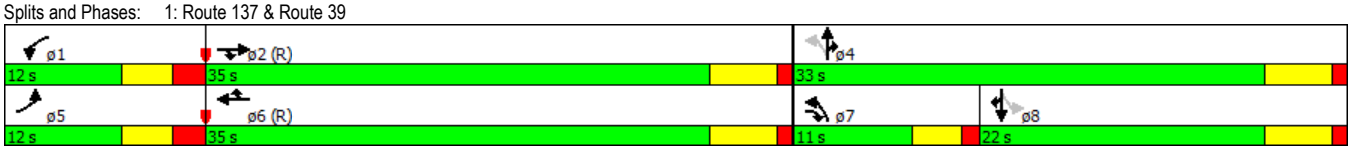
Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.55
Intersection Signal Delay: 49.1 Intersection LOS: D
Intersection Capacity Utilization 78.5% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 137 & Route 39



Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	535	0	2	645	5	1	0	0	1	0	0
Conflicting Peds, #/hr	0	0	3	3	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	93	93	93	25	25	25	25	25	25
Heavy Vehicles, %	2	2	2	4	4	4	0	0	0	0	0	0
Mvmt Flow	0	594	0	2	694	5	4	0	0	4	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	699	0	0	594	0	0	1295	1297	597	1295	1295	699
Stage 1	-	-	-	-	-	-	594	594	-	701	701	-
Stage 2	-	-	-	-	-	-	701	703	-	594	594	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.236	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	898	-	-	972	-	-	141	163	507	141	164	443
Stage 1	-	-	-	-	-	-	495	496	-	433	444	-
Stage 2	-	-	-	-	-	-	433	443	-	495	496	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	896	-	-	970	-	-	140	163	506	140	164	442
Mov Cap-2 Maneuver	-	-	-	-	-	-	140	163	-	140	164	-
Stage 1	-	-	-	-	-	-	495	496	-	433	443	-
Stage 2	-	-	-	-	-	-	431	442	-	494	496	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	31.5	31.5
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	140	896	-	-	970	-	-	140
HCM Lane V/C Ratio	0.029	-	-	-	0.002	-	-	0.029
HCM Control Delay (s)	31.5	0	-	-	8.7	0	-	31.5
HCM Lane LOS	D	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	530	1	5	640	1	5
Conflicting Peds, #/hr	0	3	3	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	95	95	50	50
Heavy Vehicles, %	2	2	4	4	0	0
Mvmt Flow	582	1	5	674	2	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	585	0	1268	587
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	684	-
Critical Hdwy	-	-	4.14	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.236	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	980	-	188	513
Stage 1	-	-	-	-	561	-
Stage 2	-	-	-	-	505	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	978	-	186	511
Mov Cap-2 Maneuver	-	-	-	-	186	-
Stage 1	-	-	-	-	561	-
Stage 2	-	-	-	-	500	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	396	-	-	978	-
HCM Lane V/C Ratio	0.03	-	-	0.005	-
HCM Control Delay (s)	14.4	-	-	8.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	175	290	90	50	270	140	115	395	70	135	420	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		70	115		70	210		55	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1063			470			723			426	
Travel Time (s)		24.2			10.7			16.4			9.7	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	199	330	102	55	297	154	125	429	76	148	462	214
Turn Type	Prot	NA	pt+ov	Prot	NA	Prot	pm+pt	NA	Prot	Perm	NA	Prot
Protected Phases	5	2	2 7	1	6	6	7	4	4		8	8
Permitted Phases							4			8		
Detector Phase	5	2	2 7	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	15.0		11.0	15.0	15.0	10.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	11.0	36.0		11.0	36.0	36.0	11.0	33.0	33.0	22.0	22.0	22.0
Total Split (%)	13.8%	45.0%		13.8%	45.0%	45.0%	13.8%	41.3%	41.3%	27.5%	27.5%	27.5%
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0		2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	6.8	23.6	36.6	6.0	18.4	18.4	40.8	39.8	39.8	26.8	26.8	26.8
Actuated g/C Ratio	0.08	0.30	0.46	0.08	0.23	0.23	0.51	0.50	0.50	0.34	0.34	0.34
v/c Ratio	1.32	0.60	0.13	0.42	0.71	0.33	0.35	0.46	0.09	0.47	0.75	0.33
Control Delay	215.3	29.6	2.9	45.8	37.0	6.2	14.6	16.4	2.7	31.3	36.2	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	215.3	29.6	2.9	45.8	37.0	6.2	14.6	16.4	2.7	31.3	36.2	7.8
LOS	F	C	A	D	D	A	B	B	A	C	D	A
Approach Delay		83.8			28.6			14.4			28.0	
Approach LOS		F			C			B			C	
Queue Length 50th (ft)	~139	154	0	27	136	2	31	130	0	57	201	11
Queue Length 95th (ft)	#259	206	20	62	192	40	71	247	18	#160	#454	70
Internal Link Dist (ft)		983			390			643			346	
Turn Bay Length (ft)	95		70	115		70	210		55	160		145
Base Capacity (vph)	151	728	784	130	707	693	363	927	835	317	618	645
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.45	0.13	0.42	0.42	0.22	0.34	0.46	0.09	0.47	0.75	0.33

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.32
Intersection Signal Delay: 38.4 Intersection LOS: D
Intersection Capacity Utilization 68.8% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 137 & Route 39

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	540	0	0	530	2	1	0	0	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	25	25	25	38	38	38
Heavy Vehicles, %	1	1	1	3	3	3	0	0	0	0	0	0
Mvmt Flow	1	581	0	0	570	2	4	0	0	5	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	572	0	0	581	0	0	1155	1155	581	1154	1154	571
Stage 1	-	-	-	-	-	-	583	583	-	571	571	-
Stage 2	-	-	-	-	-	-	572	572	-	583	583	-
Critical Hdwy	4.11	-	-	4.13	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.227	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1006	-	-	988	-	-	175	199	517	176	199	524
Stage 1	-	-	-	-	-	-	502	502	-	509	508	-
Stage 2	-	-	-	-	-	-	509	508	-	502	502	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1006	-	-	988	-	-	174	199	517	176	199	524
Mov Cap-2 Maneuver	-	-	-	-	-	-	174	199	-	176	199	-
Stage 1	-	-	-	-	-	-	501	501	-	508	508	-
Stage 2	-	-	-	-	-	-	506	508	-	501	501	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	26.2	21.5
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	174	1006	-	-	988	-	-	226
HCM Lane V/C Ratio	0.023	0.001	-	-	-	-	-	0.035
HCM Control Delay (s)	26.2	8.6	0	-	0	-	-	21.5
HCM Lane LOS	D	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	540	2	2	530	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	25	25
Heavy Vehicles, %	1	1	3	3	0	0
Mvmt Flow	581	2	2	570	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	583	0	1156	582
Stage 1	-	-	-	-	582	-
Stage 2	-	-	-	-	574	-
Critical Hdwy	-	-	4.13	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.227	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	986	-	219	517
Stage 1	-	-	-	-	563	-
Stage 2	-	-	-	-	567	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	986	-	218	517
Mov Cap-2 Maneuver	-	-	-	-	218	-
Stage 1	-	-	-	-	563	-
Stage 2	-	-	-	-	565	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	17
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	307	-	-	986	-
HCM Lane V/C Ratio	0.026	-	-	0.002	-
HCM Control Delay (s)	17	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	290	85	60	325	145	125	480	75	160	480	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		70	115		70	210		55	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	1863	1583	1752	1845	1568	1770	1863	1583	1787	1881	1599
Flt Permitted	0.950			0.950			0.161			0.466		
Satd. Flow (perm)	1770	1863	1583	1746	1845	1568	300	1863	1583	877	1881	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			150			95			227
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		759			470			723			426	
Travel Time (s)		17.3			10.7			16.4			9.7	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	250	322	94	64	346	154	139	533	83	165	495	289
Turn Type	Prot	NA	pt+ov	Prot	NA	Prot	pm+pt	NA	Prot	Perm	NA	Prot
Protected Phases	5	2	2 7	1	6	6	7	4	4		8	8
Permitted Phases							4			8		
Detector Phase	5	2	2 7	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	15.0		11.0	15.0	15.0	10.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	12.0	35.0		12.0	35.0	35.0	11.0	33.0	33.0	22.0	22.0	22.0
Total Split (%)	15.0%	43.8%		15.0%	43.8%	43.8%	13.8%	41.3%	41.3%	27.5%	27.5%	27.5%
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0		2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	7.0	22.4	35.1	6.6	19.9	19.9	39.1	38.1	38.1	25.5	25.5	25.5
Actuated g/C Ratio	0.09	0.28	0.44	0.08	0.25	0.25	0.49	0.48	0.48	0.32	0.32	0.32
v/c Ratio	1.62	0.62	0.13	0.44	0.76	0.31	0.46	0.60	0.10	0.59	0.83	0.44
Control Delay	336.7	30.6	2.9	44.9	38.0	5.7	18.1	20.6	3.4	38.1	42.8	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	336.7	30.6	2.9	44.9	38.0	5.7	18.1	20.6	3.4	38.1	42.8	9.2
LOS	F	C	A	D	D	A	B	C	A	D	D	A
Approach Delay		141.6			30.0			18.2			31.8	
Approach LOS		F			C			B			C	
Queue Length 50th (ft)	~182	147	0	31	161	2	36	185	0	69	228	22
Queue Length 95th (ft)	#322	204	21	69	221	39	82	343	22	#193	#493	96
Internal Link Dist (ft)		679			390			643			346	
Turn Bay Length (ft)	95		70	115		70	210		55	160		145
Base Capacity (vph)	154	698	745	153	691	681	309	888	804	279	599	663
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.62	0.46	0.13	0.42	0.50	0.23	0.45	0.60	0.10	0.59	0.83	0.44

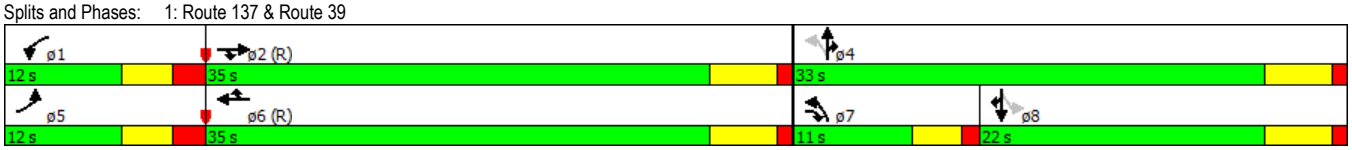
Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.62
Intersection Signal Delay: 52.9 Intersection LOS: D
Intersection Capacity Utilization 80.4% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 137 & Route 39



Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	575	0	2	670	5	1	0	0	1	0	0
Conflicting Peds, #/hr	0	0	3	3	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	93	93	93	25	25	25	25	25	25
Heavy Vehicles, %	2	2	2	4	4	4	0	0	0	0	0	0
Mvmt Flow	0	639	0	2	720	5	4	0	0	4	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	726	0	0	639	0	0	1366	1369	642	1366	1366	726
Stage 1	-	-	-	-	-	-	639	639	-	727	727	-
Stage 2	-	-	-	-	-	-	727	730	-	639	639	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.236	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	877	-	-	935	-	-	126	148	478	126	149	428
Stage 1	-	-	-	-	-	-	468	474	-	419	432	-
Stage 2	-	-	-	-	-	-	419	431	-	468	474	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	875	-	-	933	-	-	125	147	477	125	148	427
Mov Cap-2 Maneuver	-	-	-	-	-	-	125	147	-	125	148	-
Stage 1	-	-	-	-	-	-	468	474	-	419	430	-
Stage 2	-	-	-	-	-	-	416	429	-	467	474	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	34.8	34.8
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	125	875	-	-	933	-	-	125
HCM Lane V/C Ratio	0.032	-	-	-	0.002	-	-	0.032
HCM Control Delay (s)	34.8	0	-	-	8.9	0	-	34.8
HCM Lane LOS	D	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	570	1	5	665	1	5
Conflicting Peds, #/hr	0	3	3	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	95	95	50	50
Heavy Vehicles, %	2	2	4	4	0	0
Mvmt Flow	626	1	5	700	2	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	628	0	1339	631
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	711	-
Critical Hdwy	-	-	4.14	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.236	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	944	-	170	485
Stage 1	-	-	-	-	536	-
Stage 2	-	-	-	-	490	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	942	-	168	483
Mov Cap-2 Maneuver	-	-	-	-	168	-
Stage 1	-	-	-	-	536	-
Stage 2	-	-	-	-	484	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	368	-	-	942	-
HCM Lane V/C Ratio	0.033	-	-	0.006	-
HCM Control Delay (s)	15.1	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	525	50	60	640	35	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	571	54	65	696	38	43

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	625	0	1424	598
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	826	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	956	-	150	502
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	430	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	956	-	133	502
Mov Cap-2 Maneuver	-	-	-	-	133	-
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	382	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	30.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	219	-	-	956	-
HCM Lane V/C Ratio	0.372	-	-	0.068	-
HCM Control Delay (s)	30.9	-	-	9	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.6	-	-	0.2	-

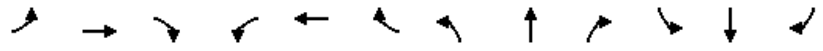
Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	565	0	0	695	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	614	0	0	755	5	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	614	0	1369	614
Stage 1	-	-	-	-	614	-
Stage 2	-	-	-	-	755	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	965	-	162	492
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	464	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	965	-	162	492
Mov Cap-2 Maneuver	-	-	-	-	162	-
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	464	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	20.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	244	-	-	965	-
HCM Lane V/C Ratio	0.045	-	-	-	-
HCM Control Delay (s)	20.4	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

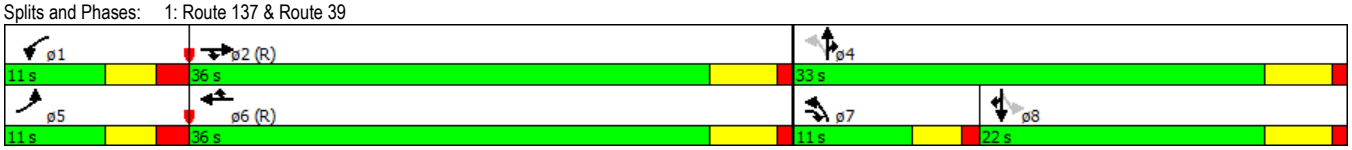


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	185	305	95	50	290	140	120	395	70	135	420	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		70	115		70	210		55	160		145
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1787	1881	1599	1736	1827	1553	1770	1863	1583	1752	1845	1568
Flt Permitted	0.950			0.950			0.211			0.513		
Satd. Flow (perm)	1787	1881	1599	1736	1827	1553	393	1863	1583	946	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			108			150			95			194
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		759			470			723			426	
Travel Time (s)		17.3			10.7			16.4			9.7	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	210	347	108	55	319	154	130	429	76	148	462	231
Turn Type	Prot	NA	pt+ov	Prot	NA	Prot	pm+pt	NA	Prot	Perm	NA	Prot
Protected Phases	5	2	2 7	1	6	6	7	4	4		8	8
Permitted Phases							4			8		
Detector Phase	5	2	2 7	1	6	6	7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	15.0		11.0	15.0	15.0	10.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	11.0	36.0		11.0	36.0	36.0	11.0	33.0	33.0	22.0	22.0	22.0
Total Split (%)	13.8%	45.0%		13.8%	45.0%	45.0%	13.8%	41.3%	41.3%	27.5%	27.5%	27.5%
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0		2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	6.4	24.0	37.0	6.0	19.2	19.2	40.4	39.4	39.4	26.4	26.4	26.4
Actuated g/C Ratio	0.08	0.30	0.46	0.08	0.24	0.24	0.50	0.49	0.49	0.33	0.33	0.33
v/c Ratio	1.48	0.62	0.14	0.42	0.73	0.32	0.37	0.47	0.09	0.47	0.76	0.36
Control Delay	279.5	29.6	2.7	45.8	37.2	5.9	15.3	16.9	2.8	32.1	37.5	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	279.5	29.6	2.7	45.8	37.2	5.9	15.3	16.9	2.8	32.1	37.5	8.0
LOS	F	C	A	D	D	A	B	B	A	C	D	A
Approach Delay		104.2			29.0			14.9			28.4	
Approach LOS		F			C			B			C	
Queue Length 50th (ft)	~151	161	0	27	146	2	33	134	0	58	205	13
Queue Length 95th (ft)	#274	215	21	62	204	40	75	253	18	#162	#457	74
Internal Link Dist (ft)		679			390			643			346	
Turn Bay Length (ft)	95		70	115		70	210		55	160		145
Base Capacity (vph)	142	728	794	130	707	693	357	917	828	312	608	647
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.48	0.48	0.14	0.42	0.45	0.22	0.36	0.47	0.09	0.47	0.76	0.36

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.48
Intersection Signal Delay: 44.2 Intersection LOS: D
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 137 & Route 39



Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	575	0	0	560	2	1	0	0	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	25	25	25	38	38	38
Heavy Vehicles, %	1	1	1	3	3	3	0	0	0	0	0	0
Mvmt Flow	1	618	0	0	602	2	4	0	0	5	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	604	0	0	618	0	0	1225	1224	618	1223	1223	603
Stage 1	-	-	-	-	-	-	620	620	-	603	603	-
Stage 2	-	-	-	-	-	-	605	604	-	620	620	-
Critical Hdwy	4.11	-	-	4.13	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.227	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	979	-	-	957	-	-	157	181	493	158	181	503
Stage 1	-	-	-	-	-	-	479	483	-	489	492	-
Stage 2	-	-	-	-	-	-	488	491	-	479	483	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	979	-	-	957	-	-	156	181	493	158	181	503
Mov Cap-2 Maneuver	-	-	-	-	-	-	156	181	-	158	181	-
Stage 1	-	-	-	-	-	-	478	482	-	488	492	-
Stage 2	-	-	-	-	-	-	485	491	-	478	482	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	28.7	23.3
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	156	979	-	-	957	-	-	205
HCM Lane V/C Ratio	0.026	0.001	-	-	-	-	-	0.039
HCM Control Delay (s)	28.7	8.7	0	-	0	-	-	23.3
HCM Lane LOS	D	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	575	2	2	560	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	25	25
Heavy Vehicles, %	1	1	3	3	0	0
Mvmt Flow	618	2	2	602	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	620	0	1225	619
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	606	-
Critical Hdwy	-	-	4.13	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.227	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	956	-	199	492
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	548	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	956	-	198	492
Mov Cap-2 Maneuver	-	-	-	-	198	-
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	546	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	282	-	-	956	-
HCM Lane V/C Ratio	0.028	-	-	0.002	-
HCM Control Delay (s)	18.1	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	530	45	55	525	35	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	576	49	60	571	38	43

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	625	0	1291	601
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	690	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	956	-	180	500
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	498	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	956	-	163	500
Mov Cap-2 Maneuver	-	-	-	-	163	-
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	452	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	25.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	254	-	-	956	-
HCM Lane V/C Ratio	0.321	-	-	0.063	-
HCM Control Delay (s)	25.7	-	-	9	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	570	0	0	575	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	620	0	0	625	5	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	620	0	1245	620
Stage 1	-	-	-	-	620	-
Stage 2	-	-	-	-	625	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	960	-	192	488
Stage 1	-	-	-	-	536	-
Stage 2	-	-	-	-	534	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	960	-	192	488
Mov Cap-2 Maneuver	-	-	-	-	192	-
Stage 1	-	-	-	-	536	-
Stage 2	-	-	-	-	534	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	276	-	-	960	-
HCM Lane V/C Ratio	0.039	-	-	-	-
HCM Control Delay (s)	18.6	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Sight Distance Worksheets

Stopping Sight Distance and Intersection Sight Distance Calculator [v0.97]
Based on 'A Policy on Geometric Design of Highways and Streets', AASHTO, 2004

Section I

Project Information

Project Number:	13207.00	**Analyst:**	VHB
City/Town, State:	Harwich, MA		
Location:	Route 39	**Client:**	
	Full-Access Site Driveway West		

Street Names and Directions

Major Street name:	Route 39	EB/WB
Minor Street name:	Site Driveway	NB/SB
Minor Street intersects *from* the:	south	
The minor street *predominantly* serves...	Passenger Cars	
Sight distance location intersection is...	Proposed	
Total number of lanes on Major Street is...	2	

Street Notes

Grade Information [enter down slope as a negative number]

Major Street Approach Grade:	0.00%	EB
	0.00%	WB
Minor Street Approach Grade:	0.00%	SB
	0.00%	NB

Major Street Speed Information

Posted		*Observed **
45	EB	41
45	WB	42

** note:* off-peak *85th percentile speeds*

Section II

ISD and SSD *Observations*

Instructions on how to observe and measure ISD and SSD are included on subsequent pages.

ISD - Intersection sight distance is the distance that is based on the time required for perception, reaction and completion of the desired critical exiting maneuver [typically, a left turn] once the driver on a minor street approach [or a site drive] decides to execute the maneuver. Calculation for the critical ISD includes the time to [1] turn left, and to clear the near half of the intersection without conflicting with the vehicles approaching from the left; and [2] upon turning left, to accelerate to the operating speed on the roadway without causing approaching vehicles on the main road to unduly reduce their speed. In this context, ISD can be considered as a *desirable* visibility criterion for the safe operation of an unsignalized intersection.

SSD - Stopping sight distance is the distance required for a vehicle approaching an intersection from either direction to perceive, react, and come to a complete stop before colliding with the exiting vehicle from a driveway. In this respect, SSD can be considered as the *minimum* visibility criterion for the safe operation of an unsignalized intersection.

			Limiting Factors:
***Observed* ISD:**	500+	looking left [west]	
(rounded to nearest 5 feet)	500+	looking right [east]	
***Observed* SSD:**	500+	traveling EB	
(rounded to nearest 5 feet)	500+	traveling WB	

Section III

ISD and SSD *Calculations* (rounded up to the next highest 5 feet) [sources: SSD - AASHTO, pp.110-117; ISD - AASHTO, pp. 650 - 664]

Cases are described in detail on subsequent pages. In summary...

B1: left turn from minor road, from stop control
B2: right turn from minor road, from stop control
B3: crossing maneuver from minor road, from stop control, assuming left- and right turns are not permitted *[otherwise, case B1 or B2 would supercede]*

***Desirable* Calculated...**		**Condition Met?**
... ISD, case B1:	465	**Yes**
... ISD, case B2:	395	**Yes**
... ISD, case B3:	405	**Yes**

[note: if number of lanes crossed exceeds 6, or if grades are steep, consult the manual]

***Minimum* Calculated ...**		**Condition Met?**
... ISD, case B1:	325	**Yes**
... ISD, case B2:	315	**Yes**
... ISD, case B3:	325	**Yes**

[note: minimum *ISD is equal to required SSD]*

Calculated ...			**Condition Met?**
... SSD:	315	traveling EB	**Yes**
	325	traveling WB	**Yes**

Section IV

AASHTO Guidance

Refer to AASHTO for specific guidance on SSD and ISD if presented with an unusual/atypical case.
Adequate ISD is not needed at signalized intersections, assuming traffic signal heads are visible on all approaches.
Any object that would obstruct the driver's view should be removed or lowered, if practical. Such objects include buildings, parked cars, highway structures, hedges/vegetation/trees/bushes/unmowed lawn, walls, fences, and terrain.
For ISD, an object should be considered an obstruction if it obstructs the vision of a driver whose eye height is 3.5 feet above th roadway surface and the object to be seen is 3.5 feet above the surface of the intersecting road.
Where horizontal sight restrictions occur on downgrades, particularly at the ends of long downgrades, it is desirable to provide SSD that exceeds those values indicated above (refer to page 114 of AASHTO).

Stopping Sight Distance and Intersection Sight Distance Calculator [v0.97]
Based on 'A Policy on Geometric Design of Highways and Streets', AASHTO, 2004

Section I

Project Information

Project Number:	13207.00	**Analyst:**	VHB
City/Town, State:	Harwich, MA		
Location:	Route 39	**Client:**	
	Exit-Only Site Driveway East		

Street Names and Directions

Major Street name:	Route 39	EB/WB
Minor Street name:	Site Driveway	NB/SB
Minor Street intersects *from* the:		south
The minor street *predominantly* serves...		Passenger Cars
Sight distance location intersection is...		Proposed
Total number of lanes on Major Street is...		2

Street Notes

Grade Information [enter down slope as a negative number]

Major Street Approach Grade:	0.00%	EB
	0.00%	WB
Minor Street Approach Grade:	0.00%	SB
	0.00%	NB

Major Street Speed Information

Posted		*Observed **
45	EB	41
45	WB	42

** note:* off-peak *85th percentile speeds*

Section II

ISD and SSD *Observations*

Instructions on how to observe and measure ISD and SSD are included on subsequent pages.

ISD - Intersection sight distance is the distance that is based on the time required for perception, reaction and completion of the desired critical exiting maneuver [typically, a left turn] once the driver on a minor street approach [or a site drive] decides to execute the maneuver. Calculation for the critical ISD includes the time to [1] turn left, and to clear the near half of the intersection without conflicting with the vehicles approaching from the left; and [2] upon turning left, to accelerate to the operating speed on the roadway without causing approaching vehicles on the main road to unduly reduce their speed. In this context, ISD can be considered as a *desirable* visibility criterion for the safe operation of an unsignalized intersection.

SSD - Stopping sight distance is the distance required for a vehicle approaching an intersection from either direction to perceive, react, and come to a complete stop before colliding with the exiting vehicle from a driveway. In this respect, SSD can be considered as the *minimum* visibility criterion for the safe operation of an unsignalized intersection.

			Limiting Factors:
***Observed* ISD:**	500+	looking left [west]	
(rounded to nearest 5 feet)	500+	looking right [east]	
***Observed* SSD:**	500+	traveling EB	
(rounded to nearest 5 feet)	500+	traveling WB	

Section III

ISD and SSD *Calculations* (rounded up to the next highest 5 feet) [sources: SSD - AASHTO, pp.110-117; ISD - AASHTO, pp. 650 - 664]

Cases are described in detail on subsequent pages. In summary...

B1: left turn from minor road, from stop control
B2: right turn from minor road, from stop control
B3: crossing maneuver from minor road, from stop control, assuming left- and right turns are not permitted *[otherwise, case B1 or B2 would supercede]*

***Desirable* Calculated...**		**Condition Met?**
... ISD, case B1:	465	**Yes**
... ISD, case B2:	395	**Yes**
... ISD, case B3:	405	**Yes**

[note: if number of lanes crossed exceeds 6, or if grades are steep, consult the manual]

***Minimum* Calculated ...**		**Condition Met?**
... ISD, case B1:	325	**Yes**
... ISD, case B2:	315	**Yes**
... ISD, case B3:	325	**Yes**

[note: minimum *ISD is equal to required SSD]*

Calculated ...			**Condition Met?**
... SSD:	315	traveling EB	**Yes**
	325	traveling WB	**Yes**

Section IV

AASHTO Guidance

Refer to AASHTO for specific guidance on SSD and ISD if presented with an unusual/atypical case.
Adequate ISD is not needed at signalized intersections, assuming traffic signal heads are visible on all approaches.
Any object that would obstruct the driver's view should be removed or lowered, if practical. Such objects include buildings, parked cars, highway structures, hedges/vegetation/trees/bushes/unmowed lawn, walls, fences, and terrain.
For ISD, an object should be considered an obstruction if it obstructs the vision of a driver whose eye height is 3.5 feet above th roadway surface and the object to be seen is 3.5 feet above the surface of the intersecting road.
Where horizontal sight restrictions occur on downgrades, particularly at the ends of long downgrades, it is desirable to provide SSD that exceeds those values indicated above (refer to page 114 of AASHTO).

PB2015-27
Greater Harwich Invest. Corp., c/o Grand Slam Entertainment
Site Plan Review Special Permit Staff Report

Agenda Item # I.c.
September 24, 2015

To: Planning Board
From: David Spitz
Date: September 11, 2015

Description
PB2015-27 Grand Slam Entertainment, Inc., applicant, Philip J. Fennell, President, Greater Harwich Investment Corp., D/B/A Cape Batting Cages, owner.

The applicant seeks approval of a Site Plan special Permit for certain site improvements and the installation and operation of an aerial adventure attraction (zip-line). The proposal is for the business operation at 322 Route 28 (Zone C-H-1).

As set forth in MGL c. 40A §9 the proposal is pursuant to the Code of Town of Harwich §325-55.C and §400 for Special Permits.

Documents
The application, the accompanying project narrative, documents and the following plans prepared for Greater Harwich Investment Corp. were submitted to the Town Clerk:

1. "Existing Conditions Site Plan in Harwich" dated August 11, 2015, prepared by Dan P. Croteau, P.E., Moran Engineering Assoc., LLC.
2. "Proposed Conditions Site Plan in Harwich", dated August 11, 2015, prepared by Dan P. Croteau, P.E., Moran Engineering Assoc., LLC.

Waivers
No waivers have been requested; however, Staff recommends that the applicant request a waiver of the 10' side yard parking setback as required in Section 325-42.L. The waiver request may take place at the Planning Board meeting.

Comments from other Boards, Departments, Committees
Fire, Health, Highway, Conservation, Engineering: No concerns.
Building: Structure is required to comply with applicable set-backs and state licenses and approvals are required prior to approval and operation.

Planning Staff Comments
Previous approvals for this site include:

- April 5, 1989, Site Plan Approval, 5 batting cages
- May 10, 1994, Site Plan Approval, bumper boat pool, 17 parking spaces
- September 11, 2003, Site Plan Approval, reconfiguration of batting cages, bumper boat pool and parking spaces; Special Permit for 1 apartment incidental to commercial (now known as a Mixed Use special permit).

The applicant states that the zip line will attract the bulk of additional business after 4:30 pm and that the attraction has a 2 person capacity with a 2 person wait. Doubling those numbers, the applicant estimates additional usage by 8 persons at peak time periods.

Initially, Planning Staff recommended a Site Plan Waiver as a minimal site change to an existing permitted recreational use. However, a review of permit history indicates that the location of current parking spaces does not match the most recent Site Plan approval. Therefore, Staff asked the applicant to do on-site parking counts to determine current level of summer usage and to update the parking layout plan.

Regarding parking requirements, 17 spaces were approved in both 1994 and 2003 for all existing uses. The zip line will require 3 additional spaces based on the Section 325-39 requirement of 1 space per 3 patrons plus 1 space per employee at the time of maximum use. At Staff's request, the applicant did an on-site count of actual parking usage at 2-hour intervals from mid-July to mid-August 2015. Findings were as follows for the 24 days counted:

- 10 am – parking use never exceeded 16 spaces
- Noon – parking use was 21 spaces or less on 22 days; on the remaining 2 days use was 22 and 24 parked vehicles
- 2 pm – parking use was 21 spaces or less on 22 days; on the remaining 2 days use was 23 and 24 parked vehicles
- 4 pm – parking use exceeded 21 spaces on only 1 day (22 parked vehicles)
- 6 pm – parking use never exceeded 15 spaces

The "Proposed Conditions Site Plan" depicts 26 parking spaces. However, the parking spaces along the easterly property boundary must be modified so that the permitted 2' overhang is entirely on the applicant's property. Also, spaces 10 through 14 are only 14' in length and do not meet requirements for compact car spaces, as shown. Staff recommends changing these 5 spaces to 2 or 3 parallel spaces (similar to space 1), resulting in a total of 23 or 24 spaces. Staff feels that this number of spaces is adequate based both on Harwich zoning requirements and actual plus projected use.

The applicant should provide clear directional signage to match the depicted 1-way entry and exit plan.

No additional lighting is proposed. The applicant should specify proposed hours of operation.

Administrative requirements have generally been met except that abutter cards must be submitted at or prior to the hearing.

MGL Reference
Pursuant to MGL c.40 A, §9 the Planning Board must, within 65 days of submission of application for a special permit, hold a public hearing. The 65 days expire on October 11, 2015.

Planning Board Jurisdiction
Pursuant to the Code of the Town of Harwich §325-55.C expansion or reconfiguration of any parking lot and / or driveways and the establishment of any exterior space requires Site Plan Special Permit approval subject to §325-55.E.(1).

Pursuant to §325-55.E.(1) If the site plan meets the requirements of this By-law and the Planning Board Rules and Regulations Governing Subdivision of Land and Site Plan Review, as amended, the Planning Board shall approve it… However, the Board cannot deny approval of a site plan for a use which is allowed by right (not by special permit) in the district, but may impose reasonable conditions on the proposed use (§325-55.E.(2)).

Proposed Findings: (Vote to adopt)
1. Recreation use is allowed by special permit in the commercial (C-H-1) zoning district.
2. The proposed use is a continuation and is complementary to the existing business use.
3. There is no change or alteration of the mixed-use special permit.
4. The proposed use is a harmonious operation to the surrounding area, which includes other recreation/entertainment/amusement attractions such as the Trampoline Center and Bud's Go-Karts.
5. The proposed use is appropriate and will not adversely affect the neighborhood.
6. The allowance of the parking setback waiver is not uncommon for the area.
7. Vehicle and pedestrian safety will be improved with directional signage and lane markings.
8. There is no proposed change to the sewage disposal system or other infrastructure.

PB2015-27
Greater Harwich Invest. Corp., c/o Grand Slam Entertainment
Site Plan Review Special Permit Staff Report

Vote # 1: Waivers:
To approve the following waiver:

1. Section 325-42.L. - Side yard parking setback of a minimum of 2′ where 10′ is required.

Vote # 2: Site Plan Review Special Permit: (requires a 2/3 vote of the Board)
To approve the site plan special permit for **Greater Harwich Invest Corporation** based on the fact that the application meets the necessary requirements and criteria for approval pursuant to the Code of Town of Harwich with the findings and the following condition(s):

1. The application shall meet Harwich Code Chapter 208 accessibility requirements.
2. Parking spaces shall be revised as follows:
    - All overhang areas shall remain on the applicant's property
    - Spaces 10 through 14 shall be restriped for parallel parking, and all parking spaces shall be renumbered on the plan
3. A revised site plan including required changes from conditions #1 and #2 shall be presented to the Planning Department prior to or along with the as-built submittal requirement under §400.18.G.
4. All outdoor lighting shall comply with Harwich Zoning Code Article XXI.
5. All signage shall meet and is subject to the requirement of the Article IV of the Harwich Zoning Code.
6. The petitioner shall install and maintain the following directional signage to ensure both pedestrian and vehicle safety.
    - Entrance Only
    - Exit Only
7. Any further changes to the parking areas or expansion of spaces shall be subject to further Planning Board review.

Alternatively, the Planning Board may vote to continue the hearing to a date and time certain *(need to state reason or purpose)*.